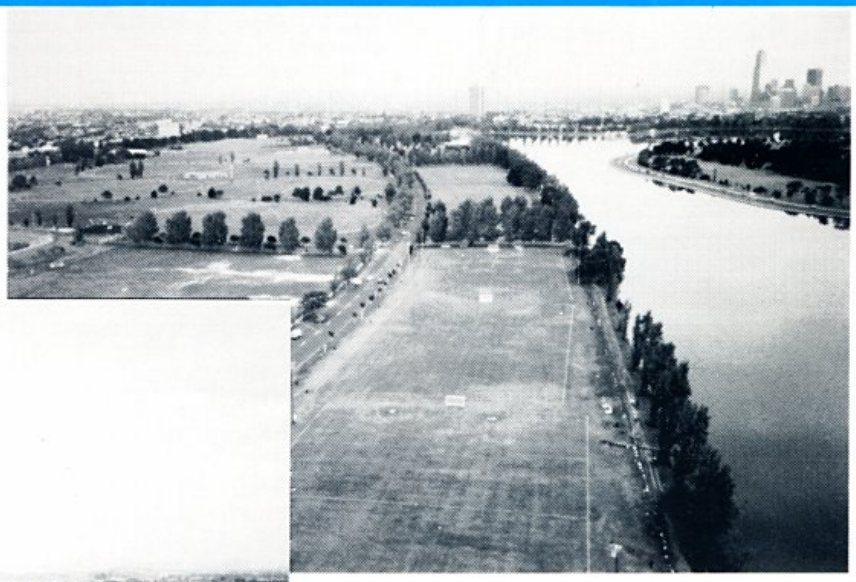
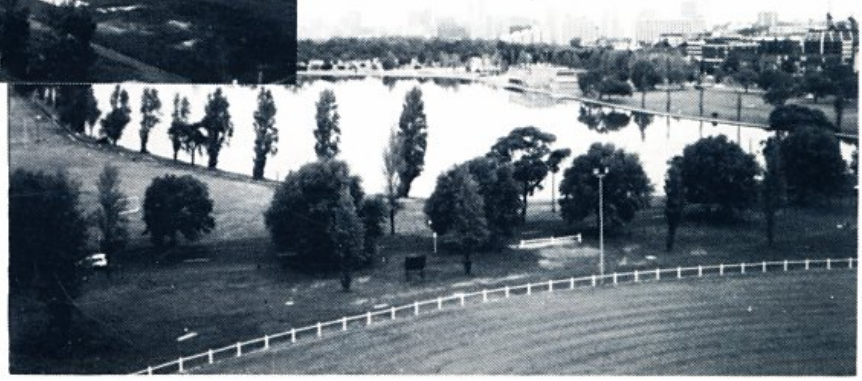
Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 12, DECEMBER 1987





ANNUAL AR INDEX

BUILDING BLOCKS – Parts 5 & 7

AMSAT COLLOQUIUM REPORT

AND DSE

The Amateur Professionals!

YAESU

Tiny on size — huge on performance

Yaesu's magnificent hand-helds

2 metre: FT23

Full 144 to 148MHz band coverage. Supplied with FNB-10 NiCad battery giving 2.5W output, plus mini rubber duckie antenna.
Cat D-3490

$599

70 centimetre: FT73

Covers 430 to 440MHz (440 to 450MHz available on special order "indent" basis). 2.0W output from FNB-10 battery supplied. Cat D-3495

$629

FC-700 Antenna Tuner

Match your transceiver and antenna perfectly! The FC-700 will give you the most from your 'rig'. Antenna matching can be as easy as turning a dial. Gives maximum power and performance from your valuable gear!
Cat D-2917

$379

Push-to-talk Switch

For use with YH-1 headset for better communication — especially mobile! Two-way switch with locking tx one way, PTT other. With LED indicator. Suits FR-230, FT-290, FR-690, etc. — with larger 7 pin microphone sockets.
Cat D-3512

$59.95

FRG-8800 DC Kit

Allows operation of your FRG-8800 on 12V DC. Great for field operation, monitoring, etc. Cat D-2822

$8.75

Desk Mic

Superbly elegant desk mic to really set off your station. Locking PTT, up-down scanning buttons plus removable base. Impedance 500 ohms.
Cat C-1114

$159.95

Yaesu FRG-9600 All Mode VHF/UHF Receiver

To call this receiver impressive would be the understatement of the decade... if not the century! There are more features, more listening capabilities packed into this receiver than would have been dreamed possible just a few short years ago!

The FRG-9600 is a scanning receiver capable of covering the **complete** 60 to 950MHz VHF/UHF spectrum. Even more, the FRG-9600 is **all mode** — FM, AM, CB, SSB... the lot. At the touch of a button, it opens up a world of communication: FM-wide for standard FM and TV station sound transmissions. FM-Narrow is your passport to the arena of two-way communication — emergency services, business, military and amateur radio. Other amateur bands plus aircraft bands are accessible through the AM and SSB modes (SSB covers up to 460MHz). Cat D-2825

$1199

Here it is: Yaesu's new

FT767GX

• All HF bands plus 6m, 2m & 70cm fitted!

Looking for an amateur transceiver? The very latestest technology available? Every possible feature to drag that signal in where others cannot... or to make sure yours is the one heard through the QRM? How about all modes on all amateur bands? Or a continuous coverage triple conversion superhet receiver from DC to light (well, almost?) An automatic antenna tuner built in? Die-cast aluminium & ducted cooling giving 30 minutes output at full power? The incredible new FT767GX is all this and more. It's the most complete amateur station available anywhere. Cat D-2935

Nothing more to buy!!!

$4995

FVS-1 Voice Synthesizer

What a great idea! Actually gives your FR-2700RH or FT-270R/RH a voice (yes, it's in English) to tell you the frequency, VFO memory selection, etc. This means you don't have to take your eyes off the road: it tells you! Cat D-3518

$79.95

FM Wide

It fits straight inside the case! Wideband FM conversion unit for the FRG-8800. Enables reception of FM broadcast signals. Easy to fit, great value! Cat D-2824

WAS $29.95 **$19.95**

Hand-Held Scan Mic

Suits all Yaesu transceivers with scanning function. 8 pin plug, very easy to hold for long period. Ideal mobile mic. Impedance 500 ohms. Cat C-1116

$56.95

FT-209RH Hand Held

With up to 5 watt output (3.7W with FNB3 battery) 10 memories (it even remembers the repeater split), keyboard entry for everything, huge range of scanning options and much more. Cat D-3503

$599

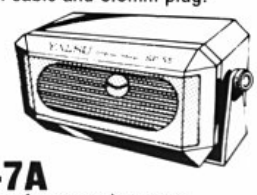
Simple mobile operation

Give your FR-2700/RH or you FT-270/RH virtual hands free convenience with the SB-10 PTT Switch Unit. Use the optional headset/boom mic etc.
Cat D-3519

$59.95

SP 55 Mini Extension Speaker

Intended especially for communications use: transceivers, scanners, etc. Just 100 × 65 × 50mm (75mm high mounting bracket supplied) and rated at 5W. Suits most transceivers (4 ohms imp) complete with 1.5m cable and 3.5mm plug.
Cat D-2913



$40

Yaesu YE-7A

600 ohm microphone for general purpose communications use. Large PTT bar for sure switching, button on mic matches screw-in mounting bracket (supplied). 4 pin plug also suits most CB's — particularly older style.
Cat C-1117

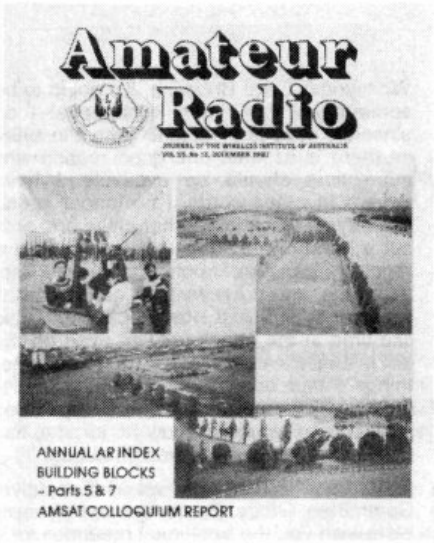
$28.95

DICK SMITH ELECTRONICS PTY LTD
P.O. BOX 321, NORTH RYDE NSW 2113

TOLL FREE ORDER BY PHONE (008)22 6610
Sydney (02) area 888 2105 for 24 hour despatch.

• NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Blakehurst 546 7744 • Bondi Junction 387 1444 • Brookvale (Warringah Mall) 93 0441 • Campbelltown (046)27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 Liverpool 600 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 88 3855 • Parramatta 689 2188 • Penrith (047)32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 • ACT • Fyshwick 80 4944 • VIC • Ballarat 3 1 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 43 8804 • Melbourne City 670 9834 • Ringwood 879 5338 • Springvale 547 0522 • QLD • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Chermside 359 6255 • Redbank 288 5599 • Rockhampton 27 9644 • Southport 32 9863 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 • SA • Adelaide City 232 1200 • Beverley 347 1900 • Darlington 298 8977 • Elizabeth 255 6099 • Enfield 260 6088 • WA • Cannington 451 8666 • Fremantle 335 9733 • North Perth 328 6944 • Perth City 481 3261 • TAS • Hobart 31 0800 • NT • Stuart Park 81 1977

Amateur Radio

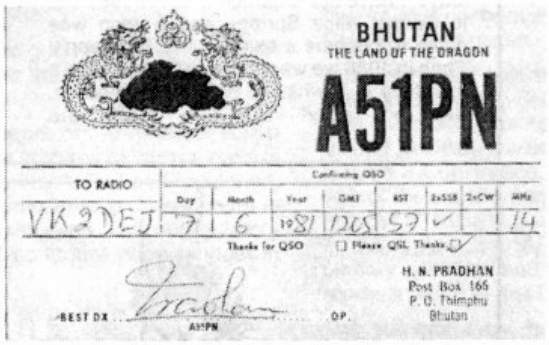


FRONT COVER: Hot Air Ballooning provides an interesting alternative to the early Peak Hour Traffic! (see story page 9).

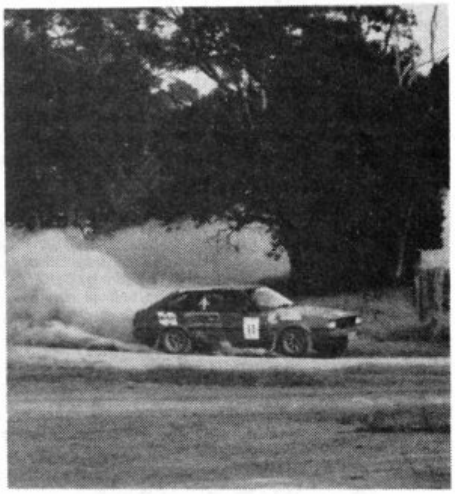
Special Features

Technical Features

New Equipment available from Icom (see page 52).



Guest DX Writer (see page 40).



WICEN Exercise (see page 55).

Regular Features

DEADLINE

All copy for inclusion in the February 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, December 29, 1987.

Amateur Radio

Published monthly as the Official Journal by the Wireless Institute of Australia, founded 1910. ISSN 0002 — 6859. Registered Office: 3/105 Hawthorn Road, Caulfield North, Vic. 3161. Telephone: (03) 528 5962.

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** by the 20th day of the second month preceding publication. **Note:** Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

Production: BETKEN PRODUCTIONS
5 Masefield Avenue, Mooroolbark, Vic. 3138.
FAX:(03) 726 7059

Laser Scanned Colour Separations by: QUADRICOLOR INTERNATIONAL (AUSTRALIA) PTY LTD
3 Lake Drive, Dingley, Vic. 3172.
Tel:(03) 551 3333

Typesetting by: BETKEN PRODUCTIONS
5 Masefield Avenue, Mooroolbark, Vic. 3138.

Make up and Photo Reproduction by: EASTERN ADVERTISING PTY LTD
PO Box 558, Lilydale, Vic. 3140
Tel:(03) 735 5410

Photographic Film and Processing Material courtesy: AGFA-GEVAERT LTD AUSTRALIA

Printed by: LEADER WESTERNPORT PRINTING PTY LTD
1 University Place, Clayton North, Vic. 3168.
Tel:(03) 560 5111.

Mail Processing by: AUTOMAIL PTY LTD
14 Stamford Road, Oakleigh East, Vic. 3166.
Tel:(03) 568 6677

Editor's Comment

THE PAST AND THE FUTURE

Only a few weeks before writing this I was one of a party of four on a rented sailing boat, all of us thoroughly enjoying ourselves in what has often been called a "yachtsman's paradise", the Whitsunday Islands of North Queensland. We also spent a few days in and around Brisbane, before reluctantly returning to Melbourne's capricious Spring. Oddly, what we came back to was more like Summer, but it didn't last. Back to Winter again after a few warm days! Still, it does keep one on one's toes and prepared for anything!

One thing for which I was not quite prepared was to find a rumour circulating that there was to be no January AR. Like all rumours, this had some foundation in fact. In view of the difficulties we have been experiencing with finance, a suggestion was made that we could save some money by not publishing a January magazine. Unfortunately, this was circulated prior to discussion by Executive which decided at its next meeting that the January issue should be published.

Reverting (no persuasion needed!) to holidays, I have not forgotten that our 1985 trip to Cairns, Alice Springs and Darwin was going to become a story in AR, but hasn't! Then in 1986 we went back to Cairns, plus a few days in Townsville before going home. Still no story! Now, in 1987, the Whitsundays and Brisbane. It's going to be some travelogue when it happens! I do sincerely hope to be able to write it in 1988, as there is at least one good reason why more time should be available. I have retired! In other words, I no longer spend five days a week in another place and hold out a hand on pay-day. Instead, I collect a regular pension, comfortable if not generous, and if necessary I can spend all my time editing AR! However, I would also like time in the shack (maybe even on the air?), and there are a few hundred other things I had been putting off until retirement. You've heard of the newly-retired person who wondered how he (or she) has ever found time to go to work? It's true!

Every year in December, we all (Executive, Committee, Office, Producers and whoever else) wish you the traditional greetings for a Merry Christmas and a Happy New Year. Again this is our pleasure, and hopefully yours too. But this time it will be a rather special New Year. Two hundred years since the First Fleet landed at Sydney Cove on January 26. May we all enjoy a thoroughly memorable Bicentennial New Year, and may amateur radio (and Amateur Radio) play an even bigger part in the future than it has in the past!

73 from Bill Rice VK3ABP
Editor

"QRX one, OM — Just had a lightning strike here!" — VK2COP

PRESIDENTIAL

CHRISTMAS MESSAGE

As we draw close to 1988, a special year in the history of Australia, the 200th Anniversary of the arrival of the First Fleet in Sydney, it is impossible not to be aware of the vast advance in communications that have taken place since those first European settlers arrived here 200 years ago.

As you are no doubt aware, the WIA has negotiated with the DOTC for some very special call signs in order to celebrate the occasion. These call signs, one for each State and Territory, commence with the prefix VI88. These call signs do not conform to the internationally allowed amateur call sign format prescribed in the International Radio Regulations. As a special favour to the WIA, the DOTC sought, and received, permission for their use from the ITU. We thank the DOTC for their co-operation.

For those who wish to use it, the prefix AX will be available as a substitute for the usual VK prefix during 1988.

In our 75th anniversary year, 1985, we had good reason to look back at our own WIA history, and the progress amateur radio has made over our 75 years of existence.

This year, let us look to the future, the future of the Amateur Radio Service, the future of the WIA. One of the features of current days is the move to extensive deregulation with its implied self-regulation. Many of the past regulations which we considered an impediment to the progress of amateur radio have been removed. This deregulatory move, is also being applied to other radio communication services in Australia.

In the light of this, co-operation between all users is essential if we are to avoid spectrum anarchy.

It has been the unfortunate experience of the Amateur Radio Service in the past, that its existence has been endangered by other users with vested interests.

The requirements of the Amateur Service are simple and not excessive. It is only courtesy that these be given full consideration when spectrum planning decisions are being made. However, if we are to be credible, we must keep our own house in order. Cases have been observed where behaviour by some stations on the amateur band leaves a lot to be desired, and does our cause no good at all.

The discussions that the WIA has with the DOTC has always been carried on, bearing in mind advances in communications technology which, when tried by amateurs, should not be hampered unreasonably by regulation.

There are many exciting advances happening in the telecommunications field, let us make the most of them. It is the amateurs who do things just because they are there to be done, and the reward is the pleasure they get out of just participating in the activity.

TO A RATHER SERIOUS MATTER

There seems to be a distinct possibility that there will be an ITU conference in 1992 with the frequency allocations of limited parts of the spectrum on its agenda. All this is speculation at the moment, but the areas of concern are in the bands, HF around 7 MHz, and UHF 1 GHz, plus and minus.

It is convenient that there will be a Region 3 IARU Conference in 1988 (to be held in Seoul just after the Olympic Games), as this will give the IARU societies, in the Region, a chance to prepare their unified position, particularly in the light of regional concerns. This Region 3 Conference will also provide an opportunity for Australia, one of the world's major amateur societies, to tender its views on a number of important issues, such as the promotion of amateur radio in the region, the IARU Constitution, the possible provision for a plenary meeting and financial matters such as funding of IARU representation at an ITU conference.

The sunspot cycle has turned the corner. Conditions on the HF bands will improve, our new bands at 18 and 24 MHz will become more useful, particularly as 1989, the date set for their clearance from non-amateur stations, approaches.

In conclusion, on behalf of the Executive, I would like to wish you all the best of Seasons Greetings and may 1988 increase your amateur radio horizons.

David Wardlaw VK3ADW
Federal President

Seasons Greetings

FEDERAL NEWS

DEADLINE DATES

I'm writing this column in readiness for the producers of AR, who have specified November 2, 1987 as the deadline date for my copy for the December magazine. There have been a few queries regarding why I'm talking about the Executive Meeting of September 22, in the November magazine.

The Executive Meetings are held on the fourth Tuesday of every month, and the October meeting was on October 27, and the November magazine was printed and ready to be posted on October 21, 1987. Labels were printed on the computer in this office on October 21, 1987, for Automail to place on the flysheets to go inside the plastic cover of the magazine. So, as you can see, the deadline dates preclude me from discussing the November meeting in the December issue!

EXECUTIVE MEETING, TUESDAY OCTOBER 27, 1987

There was an Executive Meeting on Tuesday, October 27. Following is a brief outline of this meeting.

The meeting was chaired by David Wardlaw, and attended by M Owen, A Foxcroft, P Gamble, W Rice; apologies being received from W Roper, R Burstal, S Phillips and R Henderson.

Areas of discussion included Amateur Radio Limited, finance, special call signs for the Bicentennial Year, *Amateur Radio* magazine, Call Book, devolvement of examinations, FTAC report, Standards report and IARU report, etc.

The details of the acquisition of the company, Amateur Radio Limited, from the VK3 Division are being finalised.

The President noted that the membership subscriptions were down slightly, but that we could still make budget for 1987. The Secretary reported that the debtors are the lowest for some time.

The DOTC forwarded a letter outlining the issuing of special call signs for the Bicentennial Year.

The Department is in the process of putting the finishing touches to the paper on devolvement of examinations which will go to the Minister. There will be a Joint Meeting between Executive and DOTC in Melbourne. An official from the Department will then visit Divisions to explain the position in general terms and seek information on details of local conditions in each State. The time scale envisaged at the moment is for devolvement to be phased in over 18 months — which would be approximately the middle of 1989.

In the Standards Report, Alan Foxcroft reported on Wireless Video Transmitters. The DOTC and the WIA are still "crossing swords" on this; there is no clear statement from the DOTC when protection would be afforded to the amateur services. There is need for an agreement on principles. We continually preach the theme that amateur radio is an internationally recognised radio communication service, and should have automatic protection from outside devices which are not recognised as bona-fide spectrum users.

The next Executive Meeting is scheduled for Tuesday, November 24, 1987.

ITEM OF INTEREST

An item of interest was a letter received in this office during October, re the Irish Radio Transmitters Society and a link-up with all the *Dublins* in the world to celebrate 1000 years of Dublin, Ireland as a city. Australia's Dublin is situated in South Australia.

SAVE AR FUND

Due to the fact that AR is under review and the establishment of a special purpose fund is inappropriate to our accounting methods, the Executive states that it has not established a Save AR Fund.

UPDATING OUR RECORDS

Even though there will not be a Call Book published by us this year — this office asks you to please keep us up-to-date with you and your non-member amateur friends movements. Any upgrade of call sign or change of address will be gratefully received by our Membership Secretary, Mrs Helen Wageningen. Do not address this particular mail to the Editor — only to the Membership Secretary.

Only articles for publishing and letters for *Over to You!* should be addressed to the Editor.

PAID UP LIFE MEMBERSHIP

Paid up Life Memberships are now available to members who decide that this is the method of payment suitable to them — $750 in one payment or, alternatively $275 each year for three years. Please apply to the Federal Office.

MAGPUBS

Elsewhere in this magazine is a list of publications, available from the Divisional Bookshops. If you are thinking you cannot remember the last time you saw a list of books and prices and AR — you are right! But the reason is that the Divisions each have their own Bookshops and they each publish a list of books, etc, and there are differing prices depending on where you live within that Division — with or without postage. But we thought our members should be able to read the list of publications this Institute offers at very good discount prices — it is a membership benefit! RSGB have increased the price on most of their publications dramatically — and with the immediate status of the $A, the prices are correct at time of printing, but will need to be reviewed from time to time. Please support your Divisional Bookshop.

1988 MEMBERSHIP SUBSCRIPTION RENEWALS

Elsewhere in this issue you will find a list of the new subscription rates for 1988 in your Division, and a few words of explanation on the status of membership. Please forward your subscription renewals as promptly as possible, as this office will be closed from December 23, 1987 and reopening on January 4, 1988.

MAILING HOUSE

Every month several magazines just do not arrive at their destination. If this happens to you please do not write to, or ring, Automail Pty Ltd, our mailing agent. They do not have stocks of ARs, they are couriered to this office after the magazines have been posted. So, please write to this office and we will forward another magazine immediately.

GOODS FROM OVERSEAS

We receive many calls in this office from members going overseas wanting to know how they will fare with Customs on re-entering Australia with amateur equipment. I refer members to two articles previously published on import duty — *Amateur Radio* February 1984 and September 1985.

After a 1983 bylaw was implemented allowing the importation of amateur transceivers at two percent levy ***subject to these transceivers being certified by the Federal body of the Institute as not capable of transmitting outside the amateur allocated frequencies,*** a Technical Committee was formed for this purpose. However, this was initiated for the importers, and is not suitable for individuals importing a single item, as the transceiver, plus handbook must be forwarded to the Technical Committee before any certificate can be issued, and a fee is charged for this service. This procedure allows the purchase of amateur transceivers at retail outlets at a much lower cost than otherwise would be the case.

Amateurs travelling overseas and wishing to bring accompanied equipment back to Australia with them have not experienced any difficulties. But, since July 1, 1987, there is a limit of $400. Whereas there used to be a whole range of concessions for individual items, most of these have been removed and the general concession has been doubled from $200 to $400 a head. It would be wise to check with a travel agent who will have copies of *Australian Customs Information.*

We have also heard from members who have ordered transceivers (a single item) from overseas to be delivered to them here in Australia, who have been informed, when the item arrived, that not only duty, but also sales tax was payable, making their purchase expensive.

On behalf of the Federal Office I would like to extend to all members and their families the best of Christmas wishes and a Happy New Year.

Compiled by: Ann McCurdy
Federal Office Secretary

At this time of falling investments there is no better value than the

ETI 1988 YEARBOOK

Packed full of features on
1. CAD/CAM developments
2. Test/Measuring Instruments
3. Computer Products
And much much more. If you want to know anything on Australian technology be sure to buy the

ETI 1988 YEARBOOK

at the give-away price of $3.50

The VK2AWI Packet Radio Bulletin Board

Andrew Keir VK2AAK

Packet radio is growing rapidly in popularity all over the world where licensing administrations permit packet radio operation for amateurs. The development of packet radio parallels somewhat that of dial-up data communications using the switched telephone network, where dial-up 'bulletin boards' provide the 'glue' that binds the enthusiasts in the group. On-air open access packet radio bulletin boards serve a similar purpose on the amateur bands.

IT'S NOT CERTAIN whether the NSW Division of the Wireless Institute of Australia was the first Division to introduce a packet radio bulletin board, but it is strongly suspected that this is the case. In view of the fact that this system is now well established and gaining popularity, it may be a good time to describe exactly what it is and what it does.

A little history

The VK2AWI bulletin board first went on air in March 1987 under the call sign of VK2AAK. This was a "public" system for all amateurs and was set up by Andy VK2AAK, at Seven Hills, New South Wales, in an effort to clear some of the congestion which was apparent on the primary Sydney area frequency of 147.575 MHz. Several bulletin boards were active on that frequency and because of the large amount of traffic being handled, many users experienced frustration when trying to access them. For this reason, VK2AAK was established on 147.600 MHz to serve the local packet community whilst leaving existing systems on 147.575 MHz to handle more of the "trunk" traffic from interstate and overseas.

Although the equipment and software were available to provide "gateway" facilities to HF channels, a deliberate decision was made not to do so in keeping with the concept of a "local" system.

The choice of frequency proved to be quite an advantage, with many users finding that they could read messages or download files without heavy congestion of the channel causing the system to slow down or "retry-out". The biggest disadvantage in using 147.600 was that there were no dedicated digipeaters to extend the range as there were on 147.575 MHz. This meant that, initially, there were some areas of Sydney which had difficulty in accessing the system.

In early April, Andy VK2AAK, went to work at *Australian Electronics Monthly*. It was immediately apparent that the location of the Magazine's office in South Wahroonga, a northern Sydney suburb, high on a ridge not far from Pierce's Corner, offered an excellent VHF site with high elevation and an almost clear take-off in all directions. The decision was made to move the system to the magazine's premises. Once this was done, coverage improved markedly and popularity started to climb.

At about this time, one of the topics being examined by the VK2 Divisional Council of The Wireless Institute of Australia was the establishment of a packet radio bulletin board. It did not take long to realise that the simplest solution was to make use of an existing system and Andy, who was a member of the council, volunteered the use of VK2AAK. This was accepted and in mid-May, the system became the "official" VK2 Division bulletin board. The call sign was changed to VK2AWI on June 1.

So, what does it do?

For those who are not familiar, a packet bulletin board is a system along similar lines to the many telephone bulletin boards which have become popular over the last few years. It allows users to connect to the system and read or leave "mail" or general bulletins. Files containing items of interest such as satellite predictions or even computer programs can be uploaded to, or downloaded from the board.

Where a packet system differs from the telephone system lies in the fact that access is via radio instead of telephone lines. Any suitably licenced amateur station who has a computer and packet terminal node controller (TNC) can gain access.

To avoid tying up the channel unnecessarily, the prompts and system messages generated by the bulletin board are short and to the point. Packet radio bulletin boards are far less verbose than their telephone counterparts, although systems such as VK2AWI provide extensive "help" files which can be requested by the user.

One of the major assets of packet radio bulletin boards is their ability to forward messages or bulletins to other similar bulletin boards. If, for example, a Sydney amateur wanted to send a message to an amateur in Newcastle, he could send it to his local bulletin board addressed to the board nearest the Newcastle amateur and the message would be automatically forwarded. This system will also work on a far greater scale, as by sending messages to bulletin boards providing HF facilities, messages can be sent all over the world!

Because VK2AWI was established on 147.600 MHz, the forwarding of messages to and from other systems on 147.575 MHz presented a problem. This was overcome by modifying the transceiver to change frequency automatically under the control of an external timer. In the wee small hours, the transceiver changes to 147.575, the system sends any messages it has for the other system and then automatically requests any messages the other system has for VK2AWI or it's users. When all the forwarding has taken place, the transceiver is switched back to it's normal operating frequency. The same thing could have been accomplished by using a second TNC and radio, but in view of the extra cost and complexity, it was decided to take the cheaper and easier alternative.

What's it used for?

The original concept of the bulletin board was as a local message system. Because of the ease of access and the fact that one of the frequent users of the system was the VK2 Division's broadcast officer, it became a "de-fact" destination for Wireless Institute news and broadcast items. Since becoming VK2AWI, the system is used by many clubs and individuals for leaving items for the weekly broadcast as well as an efficient medium for the distribution of information from the Institute. Messages can be left on the system for the VK2 Division although users are encouraged to send formal correspondence via the regular mail system to the Institute's office.

Many other items of general interest are carried, including satellite predictions, coming events and reprints of the weekly broadcast. Satellite bulletins taken directly from UO-9 and UO-11 are stored on the system and interesting items downloaded from the WIA federal division telephone bulletin board are often made available.

The system also stores a good number of public domain programs of interest to radio amateurs. These include such things as propagation forecasting, satellite tracking and antenna design. A deliberate decision was taken not to store "game" type programs as disk storage is limited and this type of software is easy to find on most telephone bulletin boards.

The mail system handles all sorts of diverse messages, covering a wide range of subjects. A good example was the recent debate on extended novice privileges. The system was running hot as users sent their views on the subject to each other. Although the system is run under the auspices of the WIA, there is no discrimination as to who can use the system and what subjects can be discussed. VK2AWI packet BBS is a resource open to all suitably licenced amateurs and should be regarded in much the same light as a WIA-sponsored repeater. Use and enjoy!

WIVK2A MailBox/GateWay Statistics 870901|0215 Thru 870919|0904

Connects vs. Hour vs. Date

Da	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Totl
1	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	2	4	5	1	3	1	19
2	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.	1	.	1	.	4	3	2	.	1	15
3	.	.	1	.	.	.	.	.	1	.	.	1	.	.	.	1	.	3	1	2	1	3	4	1	19
4	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	3	1	3	2	3	15
5	.	.	1	.	.	1	.	1	1	.	5	.	1	1	.	2	2	3	2	2	5	4	.	.	31
6	1	.	.	1	1	1	.	.	.	1	.	.	.	2	2	1	3	5	3	2	1	3	1	1	29
7	.	.	.	.	.	.	1	.	.	2	3	.	.	.	1	.	1	3	1	4	4	3	5	2	30
8	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	2	7	4	5	6	3	32
9	.	.	1	.	.	.	.	.	.	.	1	1	1	.	1	2	1	1	.	.	4	7	4	.	24
10	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	1	4	2	2	.	1	17
11	.	.	1	.	.	.	.	.	.	1	.	.	.	1	.	.	.	2	2	1	4	8	1	.	21
12	1	.	1	.	.	.	1	.	.	1	2	.	2	.	.	3	3	6	2	.	4	.	2	1	29
13	.	.	1	.	.	.	.	.	1	1	2	3	1	.	1	2	2	1	1	.	2	2	8	1	29
14	2	.	.	1	.	.	2	1	.	1	3	1	.	.	.	.	.	1	3	1	5	2	4	.	27
15	.	.	.	1	.	.	.	.	1	1	.	.	.	.	.	1	.	.	1	3	2	4	2	1	17
16	.	.	1	.	.	.	.	.	.	1	.	.	.	.	3	1	1	1	4	3	6	1	2	1	25
17	.	.	1	.	.	.	.	.	.	1	.	.	.	2	1	2	.	2	1	2	5	1	1	.	19
18	.	2	1	.	.	.	.	.	.	1	2	1	.	.	.	2	.	2	.	3	1	1	.	1	17
19	1	1	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
23	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
24	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
28	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
	6	3	12	4	1	2	4	4	6	12	18	7	7	7	9	18	18	37	27	45	59	52	45	18	421

System Time: (HHH:MM)

Online	410:49		Messages Received 138
Sysop	22:58	5.6% of Online Time	Messages Forwarded 12
Available	387:50	94.4% of Online Time	Trafic Received 0
Connected	43:37	11.3% of Available Time	Traffic Sent 0

This printout shows the statistics for VK2AWI for the month of September. It shows connects versus hour versus date and clearly points out the peak times of use. The WA7MBL software keeps a very comprehensive log of the bulletin board activity and is very useful in analysing the system's performance.

The hardware and software

The computer which runs the system is a PC XT compatible with 640k RAM and a single 20 megabyte hard disk. The software currently in use is the WA7MBL version 3.20 code which provides extensive forwarding and message handling facilities as well as supporting multiple TNCs and radios.

The system runs under true multi-tasking software so that the computer is not tied up at all times just running the bulletin board. As an example, this article is being written using a word processing program whilst the bulletin board is running simultaneously in the background.

The primary TNC is a GLB TNC2-A although an AEA PK-232 is available as a standby. The transceiver is a much modified commercial unit which runs approximately 25 watts to an omni-directional vertical collinear of about 3 dB gain. As the station operates unattended for the majority of the time, extensive precautions have been taken to ensure that failures do not cause interference. Apart from the internal "watch-dog" timer in the TNC, a separate monitor is provided which detects the presence of RF and shuts off the power supply if the transmitter stays on-air for more than two minutes.

Both the transceiver and the computer are arranged so that they will re-initialise in the event of a mains power failure. The computer will automatically reload and execute the software and the transceiver automatically returns to 147.600 MHz. Backups of all the current messages are made when the system is started from the local console so that users are not inconvenienced in the event of a major crash.

System management

In common with all bulletin boards, the system is maintained and managed by a system operator or "sysop". In the case of VK2AWI, this is Andy VK2AAK. The software also allows any user to be nominated as a "remote sysop". This is useful with a system such as VK2AWI, allowing undesirable messages to be deleted or system parameters to be changed without having to actually be present at the main computer.

```
Local> W
13CMNEWS.TXT   5849  313USER.DOC     27K  A010KEPS.TXT    531  ASIANET.MAP   3672
AWARD.TAS      2198  XZZMSG.TXT     5321  BC0927.TXT      17K  BC1004.TXT     13K
BC1011.TXT      15K  BEACON.LST      11K  BULLETIN.OPS   7640  DUALTNC2.TXT  4384
EASTNET.MAP    1262  FORUM.TXT      1239  KEPLER.106     1330  KISS.DOC      7775
LINTHAR.TXT    6144  OSC11BUL.105   5360  OSC11BUL.106   5267  OSCAR10.TXT   2249
PK232.MOD       594  ROSTER.DOC     1797  ROSTER.TXT     1673  RPTRCALL.LST    21K
RPTRFREQ.LST    21K  RTTY0609.BCT    10K  RTTY1309.BCT    11K  RTTY2009.BCT    11K
RTTY2308.BCT    10K  RTTY2709.BCT   9518  RTTY3008.BCT    11K  STOLEN.EQP    8846
STOLEN.TXT     2179  TNC2.RFI       2827  TNC2V2-1.DOC    33K  USER.DOC      3325
VK1MD.PAP       18K  VK2AWARD.TXT   1265  WARNING.YAP    1627  WIANEWS6.TXT  1856
WIANEWS7.TXT   3402  EASTOZ.MAP      17K  OSC11BUL.107   5392  RTTY1110.BCT    11K
OSC11BUL.108   5386  BC1018.TXT      15K  RTTY1810.BCT   8826
  6938624 bytes free.

Local>
WA7MBL BBS v3.20 - 07/22/87

                                                    N:1192  A:63   F:10
```

Here is an example of some of the "files" stored on VK2AWI. These are items that are of general interest but may be too long to leave as messages or bulletins. Also stored here are items such as recent satellite bulletins or RTTY broadcasts. There is a separate "directory" on the system which contains a selection of public domain programs of interest to the radio amateur.

```
Local> LL 17
 Msg# TS  Size TO       @ BBS   From   Date    Subject
 1191 PN   121 VK2BYY           VK2AWI 22-Oct  Federal matter reply
 1190 PN   347 VK2KFU           VK2AWI 22-Oct  CONF OF CLUBS
 1189  N    60 VK2KFU           VK2BYY 22-Oct  VK2RWI
 1188  N   917 VK2TPH@VK2XY     VK2BYY 22-Oct  VK2RWI
 1187 PN   166 VK2KFU           VK2BYY 22-Oct  Subs list
 1186 PN   459 VK2KFU           VK2PJ  22-Oct  aus.jokes etc
 1185  N   588 ALL             VK2DUP 22-Oct  DISPOSAL.
 1184  N   732 VK2KFU@VK2AWI   VK2TPH 22-Oct  RWI AGAIN.
 1183 PY   426 VK2DAY           VK2KFU 21-Oct  Your broadcast item
 1181 PN   684 VK2TSO           VK2KFU 21-Oct  Re: JOTA
 1178 PN   509 VK2AAK           VK2TSO 21-Oct  Call sign et al
 1173  N  5501 VK2XZZ           VK2AAK 21-Oct  PROPOSED FREQUENCY CHANGE
                                AFILE: XZZMSG.TXT
 1172 BN   324 ALL             VK2AAK 21-Oct  DISPOSAL
 1169  N   312 ALL             VK2AAB 21-Oct  TNC220 mods.
 1167 PY   186 VK2TSO           VK2KFU 20-Oct  JOTA
 1163  F   226 VK2TPH@VK2XY     VK2KFU 20-Oct  Re: VK2RWI ENQUIRY
 1160  N   353 ALL             VK2BQ  20-Oct  WANTED  VIC20  MANUAL

Local>
WA7MBL BBS v3.20 - 07/22/87

                                                    N:1192  A:63   F:10
```

This is a screen dump from VK2AWI showing some of the messages which have been left on the system. The various columns provide information about the messages. The first column is the message number. This is followed by the 'type', eg: "PN" means that it is a "private" or "personal" message (P) and the "N" means it has not been read by the intended recipient. A "BN" in this column indicates a bulletin. The next column shows the size of the message, followed by the "TO" column and the "@ BBS" column (all blank in this example) which would contain the call sign of a BBS to forward this message to. The final column contains a short description or title for the message.

Many aspiring sysops would possibly change their minds if they knew how much time and effort was required to maintain a system. In the case of VK2AWI, this usually takes 30 minutes to an hour each morning to read and answer the mail, delete old or duplicate messages, check the content of messages for possible infringements of the regulations etc. On top of this, the sysop needs to keep an eye on files which have been uploaded and check for sufficient remaining disk space. Failures and crashes have to be dealt with and these often occur when installing new versions of the software. You can imagine the work involved in a large and very popular system which handles interstate and overseas mail as well as local traffic!

The future

The establishment of VK2AWI as the NSW Divisional packet bulletin board was initially something of an experiment to see if such a system would be popular. Over the past few months, the experiment has proved to be a great success with a regular user base of some 80 amateurs and many hundreds of messages being handled each month.

The success of the system is very gratifying, but considering it's status as the NSW Divisional packet BBS, it seemed to the Council that we were neglecting all those amateurs who didn't live in the Sydney area and thus could not access the system. As a result, the

VK2 Council has decided that the "experiment" is over and the system will be expanded in an attempt to serve all NSW amateurs. The expansion of the system will be made in a number of steps and the first of these will be a change in the frequency of the VHF port from 147.600 MHz to 144.850 MHz on December 1, 1987.

The new frequency has been chosen in accordance with the agreed band plan for packet radio systems, but also has a number of other advantages. By moving to the low end of the band, the frequent problem of pager interference which is common at the top end of two metres will be avoided. The other significant advantage is that the expansion plan calls for the relocation of the system to the NSW Division's transmitting facility at Dural. By choosing a frequency at the low end of the band, it should be possible to diplex the system onto the antenna used for the Divisional repeater VK2RWI on 147.000 MHz without causing conflict or desensing.

To serve the country areas of New South Wales, a second TNC and transceiver will be fitted to allow operation in the 80 metre band. Once suitable equipment has been obtained, tests from the Dural site will be conducted. Experiments by other groups with packet radio on 80 metres have proved quite successful and it is hoped that many of the more isolated groups, clubs and individuals in New South Wales, who are known to have packet capability, will be able to take advantage of the facility.

Perhaps in the future, other Divisions of the Wireless Institute will set up similar systems and an Australia-wide network can be established. Apart from being a lot of fun, packet radio lends itself to the efficient distribution of news and information and with a bit of thought and planning, amateur radio operators can build a network which would be the envy of many organisations.

This article is printed in conjunction with *Australian Electronics Monthly*. Thanks are extended to Roger Harrison and Andrew Keir.

ar

OVER MELBOURNE

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

Do you have a problem getting to work? Are you tired and frustrated with your present method of transport? Do you feel like getting above the traffic and not having to worry with the hustle and bustle of suburbia and the metropolis? Would your work mates or boss believe you if you told them you floated into work today?

It is possible, as Gil VK3AUI/BM, has done it and enjoyed a couple of QSOs during a trip across the city of Melbourne whilst on his way to the office.

Floating above the morning traffic snarl whilst you watch the sunrise over the city — a peaceful start to the day. A colourful envelope of ripstop nylon billowing above holds a bubble of hot air which lets you float over the city.

Two metres springs to life. A hand-held gives contacts far and wide. There is no electrical noise to mar reception. Acoustic noise during burner operation blots everything out. Transmissions are timed against the burner.

There are other radios on board. The pilot must talk to Air Traffic Control and to the chase vehicle. A hand-held radio is great as it is easily carried and may be held out over the edge of the basket. This takes it clear of the steel cables and ones fellow passengers.

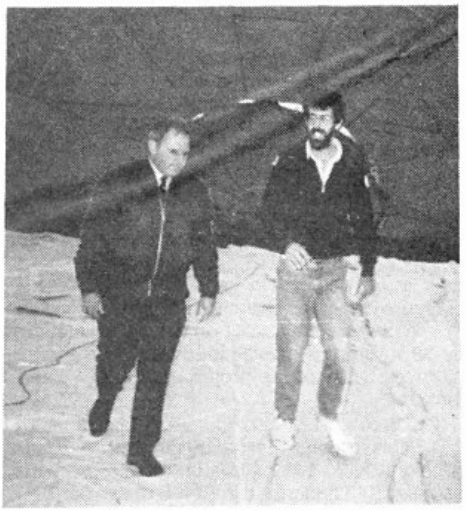
Contacts must be quick as you only have a limited time aloft. The dreamy floating of the flight is governed by the available gas from the cylinders that are onboard.

The balloon is made of ripstop nylon. Tapes run along the seams from top to bottom serving the purpose of carrying and equally spreading the load. In the top of the balloon is a large vent hole that is 'plugged' by a parachute. The pilot is able to remove the parachute, thus opening the vent and allowing the hot air to escape which aids the control of descent.

The hot air comes from a burner (fed with LPG) mounted over the heads of the balloonists in the basket, where the gas cylinders are stored.

A wicker basket is used. For all of the high technology materials that are available this old but proven material combines the two major essentials, lightness and strength.

Unpacking the Balloon.



Inflating the Balloon.

Balloon instrumentation is basic. A temperature gauge with a sensor at the top of the balloon, an essential, as no one wants to melt the balloon. The other instrument is an altimeter that indicates to the pilot the rate of ascent and descent. Two transceivers are carried — a small air-to-ground unit and a CB unit for a link to the chase vehicle.

The flight begins before dawn with a meeting at the launch site. Preliminary tests for wind direction and velocity are calculated by releasing small balloons. If all is favourable and a flight is possible the main balloon is laid out and the basket and burner assembly are connected. When all is ready and checked a petrol engine driven fan is used to blow air into the balloon to pre-inflate it. Two of the balloonists then hold the mouth of the nylon encased capsule open to allow the burner to inflate it. When the balloon is vertical, the passengers jump into the basket, the gas control is further opened to give a grater blast of hot air and the balloon commences to rise.

After the Air Traffic Control formalities are completed, the two metre operation can proceed and as the balloon rises a few hundred feet, signals are good. Unfortunately amateurs are not the earliest of risers as I have carried a hand-held on a number of flights but unfortunately have only had contacts on a few occasions. Since radio was not the prime purpose of the flights I have not been disappointed.

Ballooning is a totally different experience to other forms of flight. The balloon is a capsule of air, floating in the air where the winds determine the course of the flight. The pilot may, by selecting different winds at various altitudes have some influence of the direction one will be taken, but at all times the pilot must monitor very subtle changes in the weather and air conditions.

When a landing site has been selected and one is again on terra firma, the crew generally celebrate with a tradition as old as ballooning, a toast to the flight with champagne.

There are a number of balloon operators who conduct flights throughout Australia and a number of balloons proudly bear the label 'Made in Australia.'

ar

BUILDING BLOCKS REVISITED — Part 7

Harold Hepburn VK3AFQ
4 Elizabeth Street, Brighton, Vic. 3186

This article describes a medium power amplifier which, when fed by the pre-driver described in Part 6, will output 50 watts PEP on any amateur band for an input of less than one milliwatt.

To a certain extent this amplifier breaks new ground in that the active device is a power FET and a 28 volt supply rail is used.

This shift from the conventional 12/13 volt supply and bipolar transistors has been made primarily because the industry trend is towards higher supply voltages — with a consequent easing of matching problems — and the use of FETs with their reduced drive requirements, absence of thermal runaway and, not least, their improved close in noise characteristics.

Figure 30 gives the circuit diagram, Figure 31 the component layout on the 150 millimetre by 38 millimetre single-sided PCB and Figure 32 gives detail of the broadband output transformer.

The 50 ohm input is reduced to 12.5 ohms by T51. This transformer is bifilar wound on an Amidon BN 73-202 balun core. It is exactly the same as T43 described in Part 6 of this series.

DC bias is provided by means of the 1k0, 4k7 and the two 220R resistors from the 28 volt supply rail to the FET gate. These resistors give 4.0 volts DC at the gate of the FET under no signal conditions. This bias level gives a quiescent drain current of 0.2 amps so that the device is operating close to Class AB1 conditions.

Heavy negative feedback from drain to base is provided by the 330R two-watt resistor. An 0.1 μF DC blocking capacitor in series with this resistor prevents interaction with the gate DC bias supply.

The output impedance of the MRF 138 power FET averages about 11 ohms over the HF range and the 4:1 impedance step up of the output transformer T52 gives a nominal 50 ohm interface to the signal output filter.

Without the filter, the amplifier has a power output which is substantially flat between 1.5 and 30 MHz. However, the total harmonic content tends to be high at the LF end of this range, falling somewhat as the frequency increases, so that the real "flatness" is less than the above statement might imply. Because of the inherent harmonic content, the amplifier must **never** be put on air without a filter appropriate to the frequency in use.

The filter used here is a two section pi-network and is exactly the same as that used in the preamplifier of Part 6. Only the component numbering is different. Filter information for the various amateur bands is given in Table 2.

With a 14 MHz filter installed the amplifier — driven by the preamplifier of Part 6 — gave the following results:

Table 1.

Driver Input dBm	P Out Watts PEP	Drain Current Amps
0	0	0.2
-14	10	0.75
-11.5	20	1.0
-9.5	30	1.2
-8.5	40	1.4
-7.5	50	1.6
-6.0	60	1.7
-2.5	70	1.9

These figures indicate that the linearity of the system is quite acceptable up to 50 watts PEP, and that there is little to be gained (except a more distorted signal) by operating in excess of this level.

With the MRF138 drawing some 200 mA of quiescent current the standing dissipation is 5.6 watts. When operating at 50 watts PEP out, a further 20 watts or so of heat has to be dissipated. In short, the amplifier **must** be mounted on a good heat sink. A 150 mm length of *Minifin* is recommended and has the additional advantage of having a 40 mm central flat "valley" into which the 38 mm wide PCB fits snugly. The MRF138 bolts directly on to the heat sink through a suitably shaped hole in the PCB.

The broadband output transformer, T52, warrants some detailed discussion and reference to Figure 32 will be of assistance.

This type of transformer has a one turn primary and a secondary having two, three or four turns. The number of secondary turns is determined by the impedance ratio required. In this design there are two secondary turns to give an impedance step-up of four.

The single turn primary consists of two lengths of brass tube soldered between two end plates made of single-sided PCB material. One end plate (End 1 of Figure 32C) had the copper removed so as to isolate the two tube ends, while the other, (End 2 Figure 32C) connects the two tube ends together to make a single U-shaped turn.

On its own this "one turn" primary has insufficient inductance to be of practical use. The inductance is raised to a usable value by placing ferrite toroids over the brass tubing. In this design two Amidon FT-50-B77 toroids are placed over each brass tube to raise the inductance to around 10 microhenrys. The detailed design procedure is not over-complicated but is outside the scope of this article.

Both end plates have extensions to the copper to allow the finished transformer to be soldered onto the main PCB. End Plate 1 has extensions to allow one end of the primary to be soldered to the 28 volt supply rail and the other end to be soldered to the FET drain pad on the main PCB (pads A and B on Figures 31 and 32). End Plate 2 has two isolated pads (C and D) which have no electrical part to play and serve only as mechanical connections to the main PCB.

The secondary winding is done with well insulated flexible wire. A length of wire stripped from a piece of PVC covered power cable will do nicely. Two turns are required for T52 with "one turn" being defined as a passage of the wire through both tubes.

CONSTRUCTION

Construction begins by using the circuit board as a template to mark out the exact positions (on the central flat valley of the heat sink) of the two three-millimetre end mounting bolts and the two three-millimetre FET mounting bolt holes. The heat sink is then drilled three-millimetres.

Before bolting the PCB onto the heat sink it is easier to mount all other components **except** the FET. Just bend component leads so that they fit neatly between the appropriate pads on the circuit board and solder in place.

Then, place the board onto the heat sink with three-millimetre nuts and bolts but do not tighten the nuts at this time. Place a dab of heat conducting compound onto the base of the FET and bolt it firmly into place on the heat sink through the cut-out in the circuit board. The end mounting bolts can now be tightened. Finally, the FET leads are bent down and soldered to the appropriate pads on the circuit board. Ensure the gate and drain leads do not touch the (earthed) body of the FET.

COMMISSIONING

The amplifier should first be terminated into a 50 ohm power meter and connected to a source of 28 volts through a 0-2 amp meter. The signal input should temporarily be shorted.

On applying power the current drawn should be 200 mA plus/minus 10 percent. Most individual FETs should draw quiescent current in this range. In the unlikely event of the quiescent current falling outside the 180-220 mA range, it will be necessary to adjust the 4k7 bottom bias resistor. To reduce the quiescent current, the value of the resistor will have to be reduced (try 4k3 or 3k9) and vice versa (try 5k1 or 5k6).

The amplifier can now be connected to a signal source. It is almost certain that current model signal generators will have insufficient output to drive the amplifier to anything like full output so that it will be necessary to connect the pre-driver described in Part 6. With the pre-driver in place, input/output figures similar to those given in Table 1 should be obtained.

Some comments on the power rating of this amplifier will not go astray at this stage.

The 50 watt PEP rating implies use on modes such as SSB where the *average* power into the load is considerably below the *peak* power of 50 watts. Indeed a SSB speech signal of 50 watts PEP has an average power (totalled over, say, a few seconds) that does not exceed 5-10 watts. The exact total power will depend almost entirely on the individual voice characteristics.

If a continuous signal (say from a signal generator) is used, then the average power is more easily defined and is half the PEP level. Since most amateur power meters are calibrated in RMS power a reading of 25 watts will indicate a PEP level of 50 watts.

This amplifier is rated at 50 watts PEP — or an average power of 25 watts. This means that if it is to be used on modes having a continuous carrier — such as AM or FSK — then the output must be limited to 25 watts RMS.

The next article will begin to describe a digital dial that can be used with the modules so far described, but which can be used as a stand-alone digital frequency meter.

ar

TABLE 2 FILTER DATA

L51/51 TOROID FORMER AWG WIRE GAUGE		No TURNS			C51-54 pF
BAND	µH				
160	3.76	27	26	T50/2	1500
80	2.05	20	26	T50/2	820
40	1.08	15	24	T50/2	430
30	0.75	13	24	T50/6	300
20	0.55	12	24	T50/6	220
17	0.40	10	22	T50/6	160
15	0.37	10	22	T50/6	150
12	0.30	9	22	T50/6	120
10	0.25	8	22	T50/6	100

NOTES:
0.40 mm enamelled wire can be used in place of 26 AWG wire.
0.50 mm enamelled wire can be used in place of 24 AWG wire.
0.80 mm enamelled wire can be used in place of 22 AWG wire.

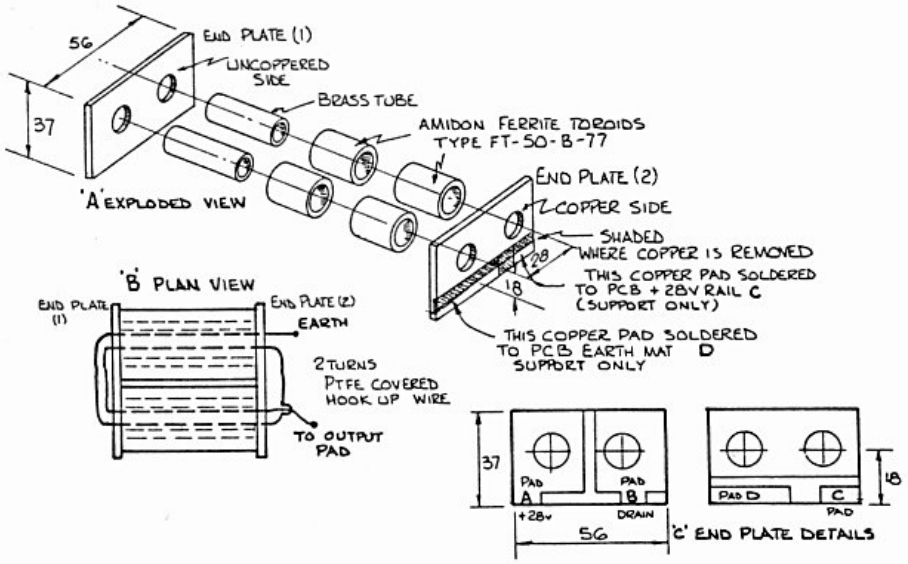


Figure 32: T52 Detail.

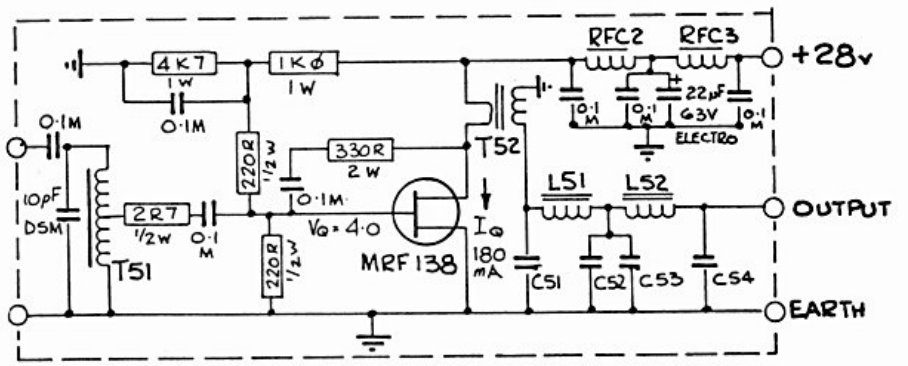


Figure 30: 40 Watt PEP Linear.
NOTES:
T51 — Seven turns No 26 AWG Enamel (0.4 mm) on Amidon BN 73-202 Ferrite Balun Core.
T52 — See text.
RFC1 — 15 Microhenry moulded RFC.
RFC2, 3 — 2.5 turns on Ferrite Bead — Philips No 4312-020-36700 or Amidon FB-43-5111.
CHI-44, L41/42 — See text for various amateur bands.
M — Monolithic Ceramic Capacitor.

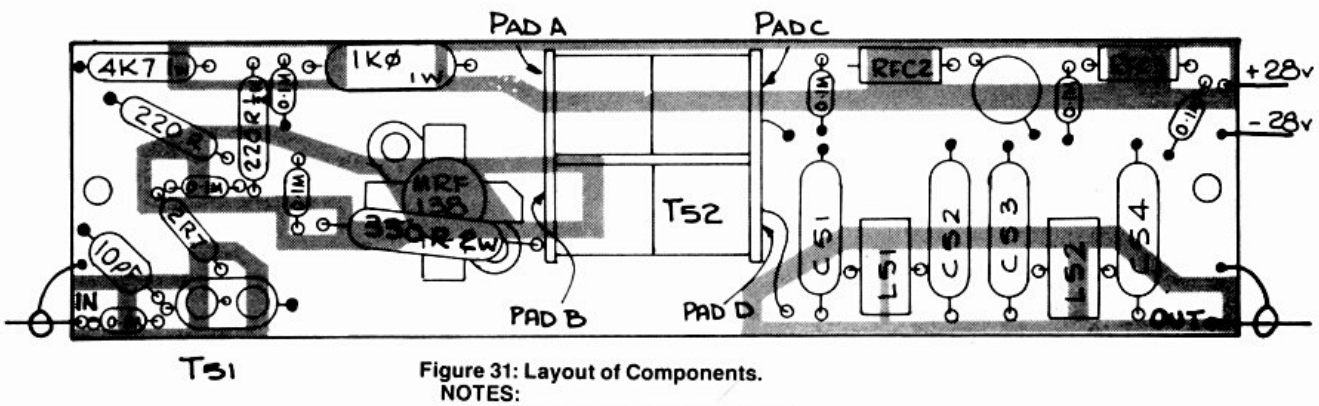


Figure 31: Layout of Components.
NOTES:
Shaded portions denote no copper
X denotes component lead soldered to pad
● denotes component lead soldered to earth mat
0.1M denotes Monolithic Ceramic Capacitor

WIRELESS INSTITUTE OF AUSTRALIA

LIST OF PUBLICATIONS AND ITEMS AVAILABLE FROM YOUR DIVISION AND THE FEDERAL OFFICE

RECOMMENDED RETAIL PRICE
PLEASE ADD COST OF POST & HANDLING — WILL VARY IN EACH DIVISION, BUT A MINIMUM OF $3.00
VK4 MEMBERS REFER TO QTC BOOKLIST.

PUBLICATIONS	
ARRL	
1987 Radio Amateur's Handbook (Soft Cover)	$35.50
Antenna Book	$19.35
Hints & Kinks for the Radio Amateur	$10.20
Weekend Projects	$10.50
FM and Repeaters for the Radio Amateur	$12.45
Satellite Experimenter's Handbook	$23.40
Solid State Design	$18.50
Yagi Antenna Design	$30.00
QRP Notebook	$13.50
Antenna Compendium	$19.45
RSGB	
Radio Amateur Exam Manual	$13.65
Amateur Radio Operating Manual	$23.40
Radio Communications Handbook	$58.00
Test Equipment for the Radio Amateur	$21.00
HF Antennas for all Locations	$23.00
VHF/UHF Manual	$31.75
Radio Data Reference Book	$22.10
Amateur Radio Software	$27.30
Buyers Guide to Amateur Radio	$24.00
UHF Compendium Parts 1 & 2	$54.50
RADIO PUBLICATIONS	
Interference Handbook	$18.00
All About Cubical Quad Antennas	$11.75
Beam Antenna Handbook	$16.00
VHF Handbook for Radio Amateurs	$18.00
All About Vertical Antennas	$16.00
The Radio Amateur Antenna Handbook	$16.00
Simple Low Cost Wire Antennas for Radio Amateurs	$16.00
Care & Feeding of Power Grid Tubes	$16.00

PUBLICATIONS	
BATC	
The Revised Amateur Television Handbook	$ 5.85
Micro and Television Projects	$ 8.00
Amateur Radio and Electronics Study Guide	$14.50
RADIO AMATEURS CALL BOOK	
International Call Book 1988	$45.50
North American Call Book 1988	$44.50
DX Guide	$ 5.60
Radio Amateur World Atlas	$ 5.60
Radio Amateur Prefix Map of the World	$ 4.10
Radio Amateur World Atlas (Maidenhead)	$ 3.00
WIA Australian Amateur Call Book 1986/87	$ 6.50
WIA Log Book	$ 5.25
"Sounds of Amateur Radio" Tape	$ 7.00
MEMBERS ONLY	
BADGES	
Traditional Australia Badge (Stickpin)	$ 4.00
International Diamond	$ 4.00
International Diamond with Call Sign Space	$ 4.00
TIES	
Navy — with WIA emblem	$ 9.50
PENNANTS	
Felt	$ 4.00
Satin	$ 6.00
WINDCHEATERS (Not all sizes available)	$17.00
LEISURE SHIRTS (Not all sizes available)	$11.00
75TH Anniversary T-SHIRTS **SPECIAL PRICE** (Not all sizes available)	$ 5.00

THESE PRICES ARE CORRECT AT THE TIME OF PRINTING

VHF/UHF BUILDING BLOCKS — Part 5

John Day VK3ZJF
5 & 7 Old Warrandyte Road, Donvale, Vic. 3111

This article explains how to build a complete six-metre transceiver and also has some ideas and corrections applicable to boards shown in Part 2 of this series.

MODULE G — SIX-METRE RECEIVER INJECTION OSCILLATOR

In Part one of this series mention was made that a synthesised injection oscillator for a six-metre transceiver would be described.

As readers may be aware, synthesisers are not easy to design when they are required for high performance. Unless a synthesiser is very carefully designed, it will fail to meet the standards of the remainder of the modules described in the *Building Blocks Revisited* and also this series. Readers may rest assured that work is definitely being undertaken on synthesised injection oscillators for HF and VHF/UHF use, but they will not be published until they meet the exacting standards of the designers.

Meanwhile, the injection oscillator, which has been used most successfully for a six-metre transceiver built using the *Building Blocks* and other modules, will be described. As pointed out earlier, it is essential that an oscillator has a very low phase noise or jitter so that reciprocal mixing products are kept to a minimum and the receiver sensitivity is put to best use.

OSCILLATOR DESIGN

When designing equipment, it is natural to think of VFOs for variable oscillators and crystals for fixed oscillators. The design of VFOs is fraught with danger. The necessary stability can usually only be achieved at low frequencies unless sophisticated laboratory equipment is available. Conversely, injection for a six-metre transceiver should be derived from an oscillator with as high a frequency as possible to avoid "birdies" and other spurious responses in the receiver and to avoid radiating signals out of band from the transmitter.

Whilst variable crystal oscillators have been around for some time, many require the use of components now almost impossible to obtain, such as split stator variable capacitors. Due to crowded band conditions, VCXOs have become popular in Europe for use in two-metre equipment and a number have been described in the European journals.

After trying many designs with various combinations of parts, the design presented here, adapted from that of Gerd Otto DC6HL, in *VHF Communications*, was the most successful tried. One of the major problems in designing a VCXO is that they cannot really be designed. The mathematics involved in predicting the operation is extensive to say the least, so it is necessary to apply the "trial and error" approach.

MODULE G1 — VCXO ASSEMBLY

This oscillator is basically a Clapp or modified Colpitts design (note the similarity with the VK3AFQ design in *Building Blocks Revisited — Part 4*), with a crystal inserted in series with the tuned circuit. As the control voltage fed to the varicap diodes G1D1 and G2D2 increases, the capacitance falls thus increasing the frequency. The amount of frequency swing depends on several variables, the range of capacitance swing available with the diodes used, how far below series resonance the crystal has been moved and the crystal itself.

The capacitance swing available from the series connected BB909 diodes chosen is more than adequate for the job in hand. As regard the second point, the amount of frequency shift should be kept as low as possible. The further a crystal is moved from its nominal resonant frequency, the less stable and "noisier" it becomes, as its effective Q drops.

Obviously the crystal is the most important part of the whole circuit. Crystals should be operated on their fundamental for best range and performance when shifted. The available swinging range is much greater in fundamental mode.

This circuit and values have reliably produced 50 kHz swings with fundamental mode crystals in the range 20-24 MHz. As fundamental frequencies for crystals are usually only available economically up to 26 MHz or so, it will be necessary to double the VCXO output frequency before it can be used for injection on six-metres. Module G1 contains the VCXO and its buffers. The signal can then be doubled and filtered on a modified local oscillator board from Part 2 of this series. This is done by using the multiplier, filter and amplifier sections appropriately modified.

For a given range of output frequencies, the crystal frequency can be determined as follows:

for a range of frequencies Fmin to Fmax, such that:

$$(Fmax - Fmin)/2 <= 50\ kHz$$

$$Fx = (Fmax/2) - 2.5\ kHz.$$

As can be seen from this, most of the movement is on the low side of the crystal. It is possible to make the variation more symmetrical if higher voltages are available to drive the varicaps, but given the need of a clean supply and the fact that all of the low level modules in this series operate from nominal 12 volt supplies, it was decided that nine volts would be the maximum available.

ALIGNMENT

Once the correct crystal is located, it is necessary to do some calculations before beginning. The two frequencies will need to be determined as follows:

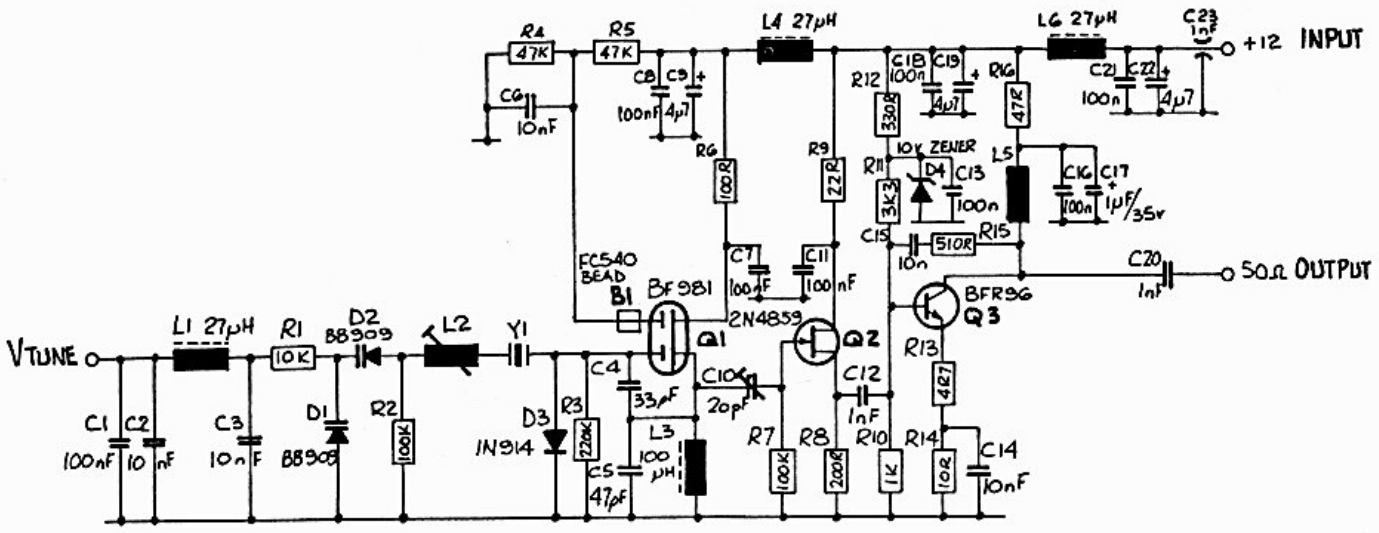
$$Fx(min) = Fx - 47.5\ kHz$$

$$Fx(max) = Fx + 2.5\ kHz$$

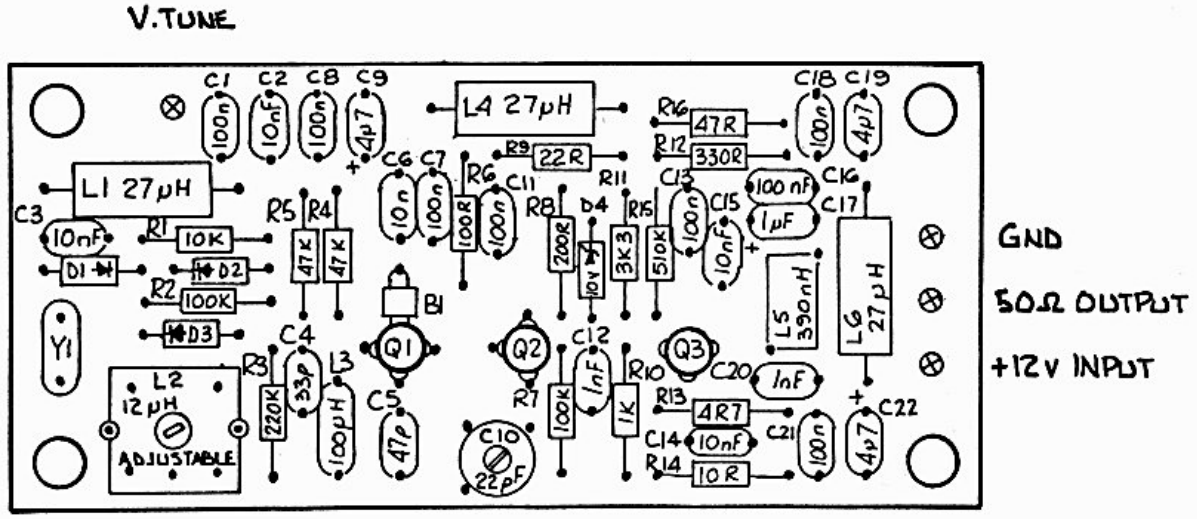
Now, armed with a digital frequency meter or a well-calibrated receiver, a multimeter and **non-metallic** aligning tool (an old knitting needle is wonderful when filed down), proceed as follows:

1. Connect the regulator PCB as shown on the diagram, and with 12-15 volts applied, check for an output of no less than 8.9 volts.
2. Set the slug of G1L2 flush with the top of the can and the rotor of G1C10 at approximately 25 percent meshed and apply power to the VCXO.
3. Set the main tuning pot to its counter clockwise (minimum frequency) end and adjust RV1 on the regulator for approximately 0.6 volts on the wiper of the pot.
4. Adjust the slug of G1L2 until the frequency is a little, say 1-2 kHz, below Fx(min).
5. Set the main tuning pot to the fully clockwise (maximum frequency) position and adjust RV1 for a frequency 1-2 kHz above Fx(max).
6. Now, return to the minimum frequency and adjust RV2 for the same Fx(min) as above.
7. Return to the maximum frequency and adjust RV1 for the same Fx(max) as before.

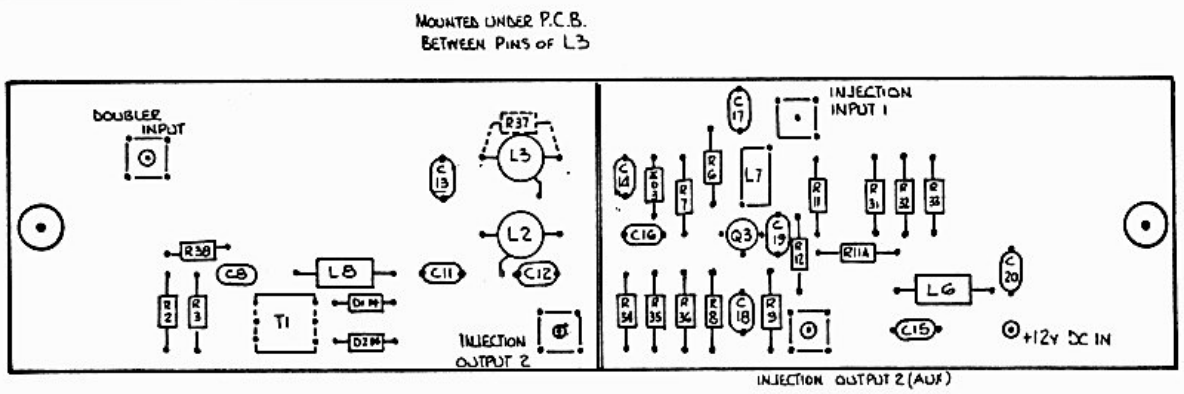
The last two adjustments may need to be repeated several times as they do interact. Trimmer capacitor G1C10 can now be used to set the output level at approximately +10 dBm and the alignment is complete! This method should ensure that you will have the appro-



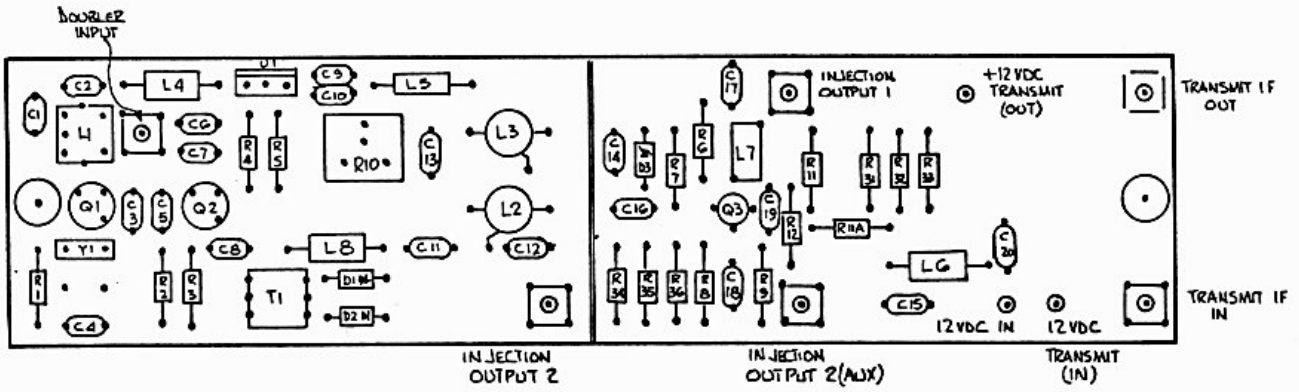
Module G — Sub-assembly 1, VCXO and Buffers.
Note: All prefixes designated with G1.



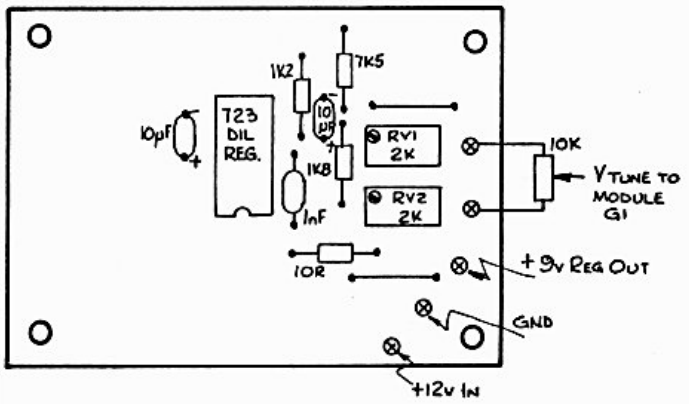
VCXO and Buffer Module — Component Layout.



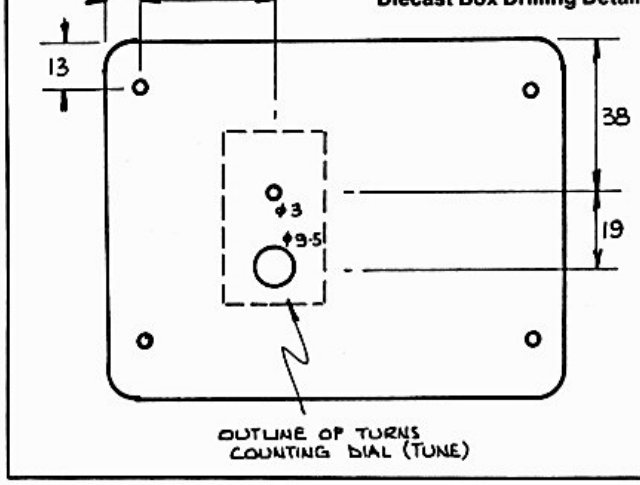
Module A1 — As Doubler, Amplifier.

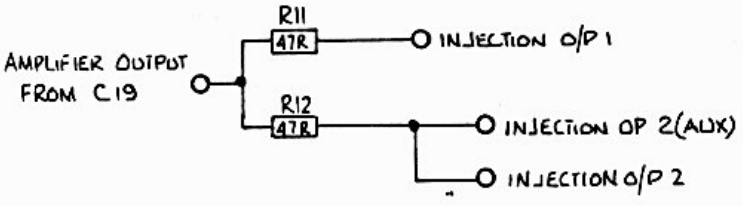


Module A1 — As Crystal Oscillator, Doubler, Amplifier.

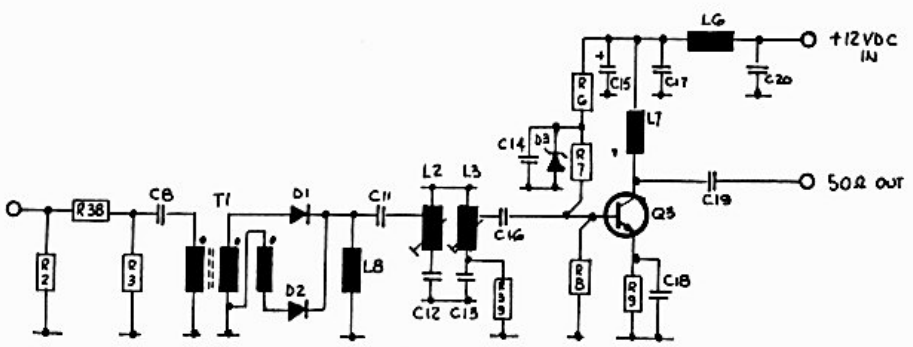


Reference Component Layout.





Module A1 — Normal Output Connection.



Module A1 — Modified for Doubler/Amplifier Operation.

priate level at the input of the multiplier/amplifier assembly.

The following table gives frequencies for crystals needed for a variety of input and IF frequencies.

Crystal Frequency versus Input and IF Frequencies

INPUT (MHz)	IF (MHz)	CRYSTAL (MHz)
50-50.1	8	21.025
	9	20.525
	10.7	19.675
52-52.1	8	22.025
	9	21.525
	10.7	20.675

TUNING VOLTAGE GENERATION

In Part 2 of *Building Blocks Revisited,* Harold Hepburn described a compact voltage regulator board for use with varicap tuned oscillators. For these oscillators to perform well they need a source of stable voltage with extremely low noise. The voltage regulator portion of Module 9 is thus ideal for what is required here (and means one less board is required).

A revised layout diagram of this board is included here showing changes made for this application. Changes of value were made to change the output voltage to nine volts as discussed above, and components associated with receiver incremental tuning have been omitted.

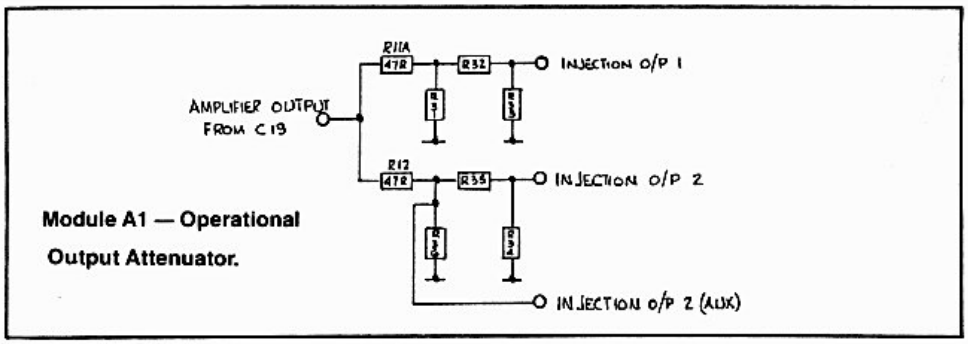
MULTIPLIER/AMPLIFIER

Once the VCXO assembly is complete and tested, a doubler and amplifier module will be required to generate the final injection frequency. For this purpose, Module A1 (local oscillator) from Part 2 of this series has been adapted. Several changes have been made to the PCB to allow this to be done more easily. Firstly, let's look at the circuit.

A connector position has now been provided on the PCB to allow easy access to the doubler input. For improved flexibility, an attenuator can be fitted at this input, in this application this is not necessary so a wire bridge is used instead of A1R38. The doubler is exactly as described earlier and thus it is not necessary to discuss it again.

The filter section following the doubler obviously needs to be modified for the much lower frequencies involved. This is achieved by increasing both inductance and capacitance values as shown in the Parts List. A minor modification has been found necessary to allow the output power level to remain constant with changing frequency, a resistor A1R39 is soldered across the pins of A1L3 on the underside of the board. This is used to purposely lower the Q of the tuned circuit A1C13/A1L3 and to reduce the input level at the amplifier.

Because the amplifier stage was originally designed for use at a much higher frequency, it poses the next problem. Unmodified, the oscillator was prone to oscillation near the desired frequency due, largely, to coupling between A1L7 and A1L3, despite the screening panel between them and their relative orientation. As this stage was designed for higher frequencies, no provision for negative feedback was provided on the PCB nor was provision made for the emitter resistor to be partially bypassed. Obviously, the easiest method of reducing the gain was to reduce the value of A1C18 to reduce the gain at low frequencies and to define the gain somewhat better at the frequency of interest. With the values as specified, it was found that A1C18 should require a reactance (Xc) of 15 ohms which is approximately 200 pF. The prototype was fitted with a 180 pF ceramic plate capacitor which worked perfectly, suppressing all tendency to oscillation and providing an output variation of less than 1 dB over the required range.



Module A1 — Operational Output Attenuator.

OTHER CHANGES TO MODULE A1

Several other minor changes have been made to Module A1 since Part 2 of this series was prepared.

1. Provision has been made for a connection point to allow easy operation of the doubler with external drive. Located immediately to the right of A1L1 it can clearly be seen on the new layout drawing.
2. If necessary. A1R2, A1R38 and A1R3 can form a low power pi-network attenuator to reduce the drive level to the doubler. This type of doubler functions best with 0 — +10 dBm of drive and this particular one is usable with output frequencies to approximately 400 MHz. If the attenuator is not used, a wire bridge should be used in place of A1R38.
3. An output power splitter and attenuators were shown on the original layout but not described, the description is to be found later in this article.
4. Terminal or connector access has been included for the transmit IF signal crossing the board.
5. Whilst the 12 volts DC transmit line is not used on the board, it is possible for it to be carried across the board for tidier and easier equipment layout.

OUTPUT CONFIGURATIONS

Although the output power splitter and attenuators were shown on the original layout, an explanation of their operation was inadvertently omitted from that article.

Output from this board is available at three connectors either with or without attenuators. These outputs can be used in several ways:

1. Single Output, Unattenuated

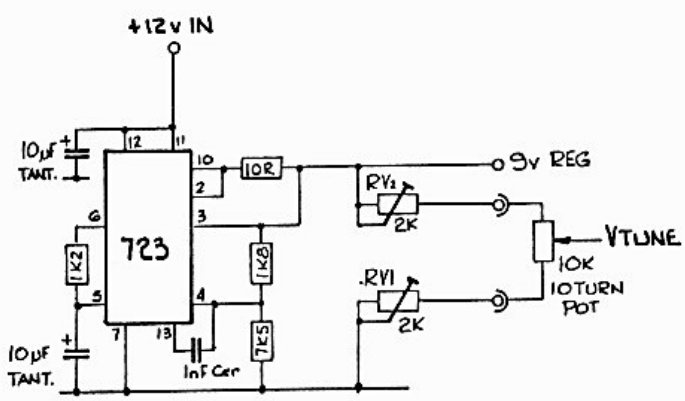
1. A1R31 — 1R36 and A1R11 and A1R12 are all omitted.
2. A wire link in place of A1R11 will take output to injection output 1.
3. A wire link in place of A1R12 will take output to injection output 2 and injection output 2 auxiliary.
4. *Only one* output should be used at any time. Because of the absence of the power splitter, power levels of 100 mW or more are available.

2. Two Outputs, Unattenuated

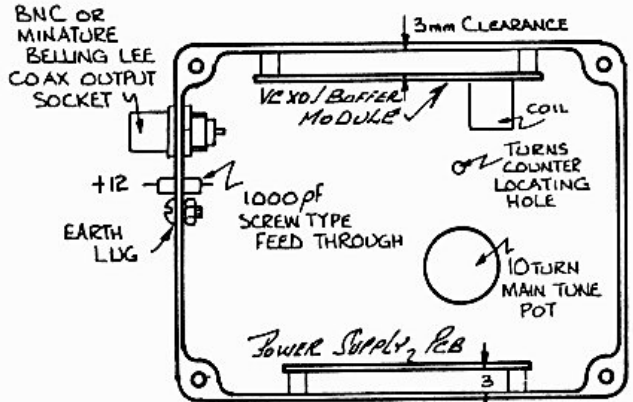
1. A1R31 — A1R36 are all omitted.
2. A1R11 and A1R12 are 47 ohm quarter watt resistors.
3. One output is available at injection output 1 and the other at injection output 2 and injection output 2 auxiliary.
4. Both outputs should be either used or terminated in 50 ohms if not needed.
5. Output at each port will be 6 dB below that obtained in 1. above.

3. Two Outputs, Attenuated

1. Remove A1R11 and fit A1R11 and A1R12, 47 ohm quarter watt resistors instead.
2. Cut the PCB track which will be found beneath A1R35.
3. Select appropriate values for A1R31 — A1R33 and A1R34 — A1R36 for the desired attenuation value. The chart in Part 3 of this series may be useful.
4. Injection output 2 (auxiliary) should not be used. *Both* outputs should either be used or terminated in 50 ohms.



Tuning Voltage Regulator.



VCXO/Power Supply. Placement of Components and PCBs in 6908P DCB.

PARTS LIST — Module A1 modified for six-metre injection

A1C8	1nF	Ceramic Plate
A1C11	1 nF	
A1C12	39 pF	NPO Ceramic Plate
A1C13	39 pF	
A1C14	10 nF	Ceramic Plate
A1C15	4.7 uF	16V or greater Tantalum
A1C16	10 nF	Ceramic Plate
A1C17	100 nF	Monolithic Ceramic
A1C18	180 pF	Ceramic Plate (see text)
A1C19	1 nF	Ceramic Plate
A1C20	100 nF	Monolithic Ceramic
A1D1	5082-2800	Hot Carrier Diode
A1D2	5082-2800	Hot Carrier Diode
A1D3	10V	400 mW 10 percent Zener Diode
A1L2	.27 — .35 uH	Miller Coil 48A317MPC
A1L3	.27 — .35 uH	Miller Coil 48A317MPC
A1L6	27 uH	Moulded RF Choke
A1L7	.59 uH	Miller Coil 75F597MPC
A1Q3	BFR96S	Do not substitute
A1R2		See text
A1R3		See text
A1R6	330 R	Five percent 0.25 watt
A1R7	3k3	
A1R8	1k	
A1R9	33R	
A1R11	47 R	or R11A
A1R12	47 R	
A1R31		See text
A1R32		See text
A1R33		See text
A1R34		See text
A1R35		See text
A1R36		See text
A1R38	OR	Wire Link (See text)
A1R39	10k	
A1T1		Seven turns Trifilar 26 SWG on Amidon T25-43 core or MCL T4-1 Transformer

PARTS LIST — Module G: VCXO and Buffer Assembly

G1B1	FC540	Ferrite Bead
G1C1	100 nF	Monolithic Ceramic
G1C2	10 nF	Ceramic Plate
G1C3	10 nF	Ceramic Plate
G1C4	33 pF	NPO Ceramic or Styroseal
G1C5	47 pF	NPO Ceramic or Styroseal
G1C6	10 nF	Ceramic Plate
G1C7	100 nF	Monolithic Ceramic
G1C8	100 nF	Monolithic Ceramic
G1C9	4.7 uF	35 volt Tantalum Electrolytic
G1C10	22 pF	Philips Film Trimmer
G1C11	100 nF	Monolithic Ceramic
G1C12	1 nF	Ceramic Plate
G1C13	100 nF	Monolithic Ceramic
G1C14	10 nF	Ceramic Plate
G1C15	10 nF	Ceramic Plate
G1C16	100 nF	Monolithic Ceramic
G1C17	1 uF	35V Tantalum Electrolytic
G1C18	100 nF	Monolithic Ceramic
G1C19	4.7 uF	35V Tantalum Electrolytic
G1C20	1 nF	Ceramic Plate
G1C21	100 nF	Monolithic Ceramic
G1C22	4.7 uF	35V Tantalum Electrolytic
G1C23	1 nF	Ceramic Feed-through on Case
G1D1	BB909	Varicap Diode
G1D2	BB909	Varicap Diode
G1D3	1N914	Silicon Signal Diode
G1D4	10V	400 mW 10 percent Zener Diode
G1L1	27 uH	Moulded RFC
G1L2	9110	J W Miller Adjustable Coil 5.35-13.5 uH
G1L3	100 uH	Radial Lead RF Choke
G1L4	27 uH	Moulded RFC
G1L5	390 nH	J W Miller 75F397MPC Moulded Coil
G1L6	27 uH	Moulded RFC
G1Q1	BF981	Dual Gate MosFET
G1Q2	2N4859A	High Current JFET
G1Q3	BFR96	Transistor
G1R1	10 k	Five percent 0.25 watt Carbon Resistor
G1R2	100 k	Five percent 0.25 watt Carbon Resistor
G1R3	220 k	Five percent 0.25 watt Carbon Resistor
G1R4	47 k	Five percent 0.25 watt Carbon Resistor
G1R5	47 k	Five percent 0.25 watt Carbon Resistor
G1R6	100 R	Five percent 0.25 watt Carbon Resistor
G1R7	100 k	Five percent 0.25 watt Carbon Resistor
G1R8	200 R	Five percent 0.25 watt Carbon Resistor
G1R9	22 R	Five percent 0.25 watt Carbon Resistor
G1R10	1 k	Five percent 0.25 watt Carbon Resistor
G1R11	3K3	Five percent 0.25 watt Carbon Resistor
G1R12	330 R	Five percent 0.25 watt Carbon Resistor
G1R13	4R7	Five percent 0.25 watt Carbon Resistor
G1R14	10 R	Five percent 0.25 watt Carbon Resistor
G1R15	510 R	Five percent 0.25 watt Carbon Resistor
G1R16	47 R	Five percent 0.25 watt Carbon Resistor
G1Y1		Series Resonant Crystal (see text)

ar

INTERNATIONAL TRAVEL HOST EXCHANGE

Ash Nallawalla ZL4LM/VK3CIT
INTERNATIONAL TRAVEL HOST EXCHANGE FEDERAL CO-ORDINATOR
PO Box 539, Werribee, Vic. 3030

As a result of publicity in *Amateur Radio* 11during 1987, the International Travel Host Exchange (ITHE) scheme has gained about a dozen volunteers in Australia. (See AR, May 1987). The list is growing slowly, but we need many more volunteers to share the pleasant task of meeting or hosting our overseas visitors. Some participants live away from tourist haunts, and Sydney is the only major city not yet represented in the ITHE. "Come on, lend us a hand. . ." (to borrow a phrase from the Bicentennial advertisements)!

Speaking of which, it is hoped that you will mention the Bicentenary to DX contacts during 1988. Expo 88 will receive its own promotion in the form of VI88EXPO, a special-event station which will be manned by volunteers from the VK4 Division.

The purpose of the ITHE is not merely to help overseas amateurs who are visiting Australia, but also to help us in our travels within our country and abroad.

In future articles I would like to share the travel experiences of WIA members, together with some helpful tips and ideas. A list of sights seen is not suitable for this column, but we would like to hear about the amateurs you have hosted or who hosted you. Have you any amusing travel anecdotes? What are your needs as a traveller? Have you any tips to pass on to prospective hosts/travellers? Are you planning a trip to a radio event such as the Dayton Hamvention, or the YLRL Convention in Hawaii during 1989?

Join the ITHE scheme and make your holiday more memorable. Complete a copy of the following proforma on plain paper and send it to me — address as above.

If your spouse is also an amateur, mention both names.

INTERNATIONAL TRAVEL HOST EXCHANGE

Registration Form

Mr/Mrs/Ms/Miss: .....
Preferred Name/s: .....
Surname: .....
Call sign/s: .....
Address: .....
.....
.....
.....
Telephone: ..... *(H)*
..... *(W)*
Languages Spoken: .....
.....
.....
Able to accommodate visitors under some circumstances: Yes/No

PAPER 4 — A PROPOSAL TO RESTRUCTURE AMATEUR RADIO LICENCING

by the Future of Amateur Radio Working Party

The Working Party Membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

BACKGROUND

The Australian amateur radio licence structure is not a static system. Changes which have occurred since amateur radio was reintroduced following World War II have included the limited licence in 1954, the novice licence in 1976, multiple choice examinations and subject credits of limited, and now indefinite duration for partially completed examinations.

Of recent times, several amateurs have addressed the licence structure. J Linton and R Harrison raised the matter in their article *Amateurs Radio — Future Direction* in AR February 1986. G Bracewell took up the novice issue in particular in *Novice Licensing into the 21st Century* in AR August 1986. Linton and Harrison returned with a revised proposal in July 1987 and the 1987 Federal Convention provided guidelines to the Federal Executive to satisfy a need caused by the Future of Amateur Radio Working Party's inability to meet during 1986.

With the reforming of that Working Party recently by the Executive, the matter of amateur radio licensing again comes under scrutiny.

AIM

To propose a detailed licence restructuring option, tested against perceived constraining factors.

FACTORS INFLUENCING OPTIONS

NATIONAL AUTHORITIES

A suitable starting point is the influence of the National Authority (Department of Transport and Communications) on any proposed licensing restructuring. Incidentally, the influences external to Australia (that is ITU considerations) have, for convenience, also been aggregated into this grouping.

Two major National Authority responsibilities emerge. The requirement to satisfy internationally the amateur licensee's competence to operate, and the requirement to be able to communicate in Morse code. These are requirements of the ITU Radio Regulations to which Australia has subscribed.

Australia has chosen to establish competency by examination and the scope of that testing is a national decision. Overseas the CERN licence for the EEC and some IARU resolutions establish a uniform standard of knowledge required for licence grades. Australia nationally, as distinct from the amateur radio national society (the WIA), has no obligation to follow these agreements.

A similar situation prevails for Morse code. Australia has chosen a particular speed and examination style for the national tests and it is very difficult to exactly equate standards worldwide. WARC 92 may vary the requirement for Morse code in the ITU Radio Regulations, however, for the present we must accept the constraint that examinations, including Morse, will continue using a national syllabus whose scope may be open to some negotiation.

EQUIPMENT AVAILABILITY

Recent FTAC band planning papers have stressed that commercial equipment availability and commercial pressures should not distort sound band planning. Nevertheless, equipment characteristics must not be neglected. Table 1 summarises the key characteristics of modern commercial amateur equipment and suggests several trends which it would be foolish to ignore in any licence restructuring. These trends are:

a. Transceivers are now the norm and split frequency operation is generally possible.
b. HF transceivers are multiband, frequency agile within bands and to some extent multimode, ie CW and SSB.
c. HF transceivers have output powers up to about 100 watts PEP although a lower power category of about 25 watts PEP exists in lesser quantities.
d. With the addition of unpretentious linear amplifiers most nations legal output power limits can be reached.
e. VHF/UHF transceivers are generally single band, frequency agile and frequency multimode, ie CW, SSB and FM.
f. Power outputs at VHF/UHF fall into two groupings; low power up to five watts average for portable self-contained battery powered equipment, ie hand-helds and "hand bag" radios, and 25-40 watts for vehicle battery powered sets.
g. Add-on linear amplifiers boost VHF/UHF transceiver outputs to about 100 watts average.

In contrast kit-set or home-built equipment is generally single band, may not have all modes and has relatively low power output frequently necessitating the use of linear amplifiers.

Emerging trends are the three power levels, namely:

★ low power up to five watts average or 25 watts PEP
★ medium power 25-40 watts average or 100 watts PEP
★ high power about 100 watts average or 400 watts PEP

The last being achieved through the addition of an unpretentious linear amplifier. These definite power levels could be related to levels of operating privileges in any restructured licence proposal.

The existence of frequency agility within any amateur band brings about difficulty in policing constrained band segments for differing grades of licence, in contrast to assigning or not assigning a complete band.

A similar argument can be advanced for emission modes, for where a transceiver is so fitted the potential (or temptation) to use all available modes exists.

This suggests that emission modes may be divided into those commonly available on commercial equipment and those available only through external modems.

In essence, the underlying theme in these equipment considerations is to match privileges to available facilities. Incidentally, it is unlikely more extensive facilities will be made available within the transceiver unit, however digital interfacing and improved software will more easily provide them external to the radio and probably on an enhanced PC. The most complex of error correcting digital signals is normally transmitted as a series of frequency modulated tones or a frequency shifted carrier.

LICENCE GRADES

The major requirements when considering licence grades are:

a. An upwards progression, with increasing privileges for increasing qualifications.
b. A range of entry points to satisfy the varied interests of those entering the Amateur Radio Service.
c. An obvious delineation between licence grades, which suggests retaining the "simple approach" with not too many grades. The five grades in the USA appear confusing to Australians because of their partitioning of HF band segments across the grades.
d. Licence grades which match user requirements. The unpopular Canadian digital class licence is an example of mis-matching perceived needs.
e. No grade shall have a theory examination level lower than the existing novice licence. This assumes the defined novice syllabus will remain stable and "on air" training can be given as "second operators" under supervision of qualified licensees.

Table 1: Equipment Characteristics.

	SOURCE	FREQ COVERAGE	MODES	POWER
HF	Commercial	Multi-band	CW/SSB	Medium
	Kit-set	Single band	CW/SSB	Low
	Home-built	Single band	CW/AM/SSB	Low
	Linears can be added to all to give higher power			
	Power:	Low 25 W PEP	Medium 100 W PEP	High 400 W PEP
VHF / UHF	Commercial	Single band	FM or CW/SSB/ FM	Low/Medium
	Kit-set	Single band	FM	Medium
	Home-built	Single band	FM	Medium
	Linears can be added to all to give higher power			
	Power:	Low 1-2 W	Medium 25 W	High 45-100 W average

The practicalities of the situation dictate that delineation between licence grades should be achieved using combinations of the existing three examination subjects; theory, Morse code and regulations.

The addition of a practical test is not seen as an examinable matter at the hobby level of amateur radio (although it is acknowledged examinable for commercial certificates). Indeed tuition in the correct practical application of amateur radio skills is seen as falling fairly and squarely into the province of local radio clubs and individual experienced amateurs.

EXAMINATIONS

It is inevitable that the Department of Transport and Communications will devolve the conduct of Amateur Certificate of Proficiency examinations to suitable bodies seeking accreditation. To this end the WIA has sought such accreditation, but in so doing has recognised the cost aspects of this action. Indeed, in endorsing the action at the 1987 Federal Convention, the Federal Council resolved that examination operations would be conducted on a full cost recovery basis. Even so there will most likely be added service to candidates through increased examination frequency, reduced lead times and more convenient examination session times.

An obvious deduction from this is that the number of different examination subjects must be minimised, to reduce both costs to candidates and administrative effort by the administering body. Many subjects means greater overhead costs hence more costly subject examination fees. Also, many subjects mean many examinations to progress from the entrance certificate to the full qualifications.

The 1987 Federal Convention, in its guidelines to the Federal Executive, identified the value of mix and match qualifications based upon multiple levels of theory and Morse code and a single regulations examination. That guidance follows closely the G Bracewell model of AR August 1986, and may be represented by the two by three matrix of Table 2 below:

Table 2: Combinations of Examination Subjects.

Theory		Basic	Full
Morse	Nil		Limited
	Slow	Novice	Combined
	Fast		Unrestricted
Regulations		One test subject	

Table 2 shows the examination subject combinations possible and the existing licence grades arising from the certificates of proficiency awarded. For completeness one could imagine a no theory column where a no theory, no Morse, no regulations, ie "no test" licence is the current CB licence.

At this stage, it becomes necessary to introduce a concept alluded to earlier both in this paper and in the earlier *Frequency Bands and Emissions* paper.

If we acknowledge the direct relationship between permitted emission modes with associated power levels and the level of theory qualification (for it is not unreasonable to require more knowledge to employ more sophisticated signal processing) then the examination theory level sets the permitted emission modes and power. As discussed earlier, most equipment is multi-mode with basic Morse (CW) and voice (SSB and/or FM) capabilities. It is also of medium power output, hence these become the permitted basic level transmission emissions and power. Bear in mind that no constraints are (or could be) placed upon reception, so the self-improvement capacity remains active.

Upon upgrading theory, the licencee is permitted to transmit on all authorised modes and at an increased power level. This is achieved in most cases by interfacing, external modem units and linear amplifiers to the basic transceiver, a task calling for greater understanding or theoretical knowledge to radiate good quality signals.

The corresponding relationship between Morse code speed and authorised frequency bands is a little more tenuous, but still clear in principle. ITU Radio Regulations confine "no Morse" qualification licencees to above 30 MHz, whilst the current novice licencee is allocated HF band segments in some amateur bands. Hence, it is argued that no Morse qualifies for frequencies above 30 MHz, slow Morse qualifies for designated band segments and fast (or should it be full?) Morse qualifies for all frequency allocations.

One perceived difficulty noted earlier is the allocation of band segments whilst equipment is frequency agile across the whole band. Should this create a problem, some adjustments to band segments are possible to ease the situation. Further, should WARC 92 eliminate the Morse requirement, the two grades "no Morse" and "slow Morse" combine into one. A more radical change might be to retain only two licence grades, novice and full.

In summary, theory qualifications determine emission modes and powers, whilst Morse code speed determines authorised frequency bands/band segments.

The proposal as presented so far offers only the current four entry points and must be enhanced to maximise that quality.

If we ascribe to the current novice licensee some VHF/UHF frequency band/s and, in keeping with the ITU Radio Regulations, offer that added privilege without HF to a "Morse-less" novice, we flesh out all feasible squares in Table 2; for the fast Morse, basic theory option is only a repeat of novice conditions.

We have in the above discussion, created five levels of licence, VHF novice, novice, limited, combined and AOCP. These could be redesignated to show the graduation in several ways as shown in Table 3.

Table 3: Licence Grades and Titles.

CURRENT NAME	NEW STYLE	ADVANCED STYLE
"VHF" Novice	VHF Novice	VHF Novice
Novice	Novice	Novice
Limited	VHF Intermediate	VHF General
Combined	Intermediate	General
Unrestricted	Unrestricted	Advanced

The Advanced Style provides a licence without any need for change or re-qualification by existing amateurs. The perceived feeling of the amateur community is there is no place/requirement/case for an "advanced licence", hence the "New Style" nomenclature is adopted for the remainder of this paper.

THE PREFERRED OPTION

In review then, Table 2 can now be fleshed out and rewritten in the form of Table 4 below and this becomes the preferred option.

Table 4: The Preferred Option.

Theory		Basic	Full
Morse	Nil	VHF Novice	VHF Intermediate
	Slow	Novice	Intermediate
	Fast		Unrestricted
Regulations		One test subject	

DETAILED PRIVILEGES FOR LICENCE CLASSES

So far, detailed privileges have not been specifically linked with licence classes or grades, although a number of considerations have been alluded to earlier. It is proposed now, to develop these characteristics in three groups (emission modes, output power and frequency band allocations) but taking note that the first two are linked for examination qualification considerations.

Emission Modes

Earlier, a distinction was observed between emission modes available from the transceiver unit proper and those possible using external signal processing modems. This situation is not confined to commercial equipment and (if anything) is more pronounced for kit-set or home built equipment. Consequently, it is proposed that CW, AM, SSB and FM modes be associated with the basic theory examination level and all other emission modes be aligned with the full theory qualification.

Output Power

Three distinct output power levels were identified earlier and it is proposed to follow the approach above for emission modes and align the basic transceiver output power (medium power) with the basic theory examination and associate the employment of linear amplifiers (high power) with the full theory examination. An alternative alignment of low power with basic theory and medium or high power with full theory has been rejected principally on grounds of matching proposals to reality. Modern multi-band solid-state HF transceivers do not readily lend themselves to power reduction modifications like the removal of one power amplifier valve did in the past.

Frequency Band Allocations

The first consideration (ie the no Morse situation), is easily satisfied — for ITU Radio Regulations stipulate no operation below 30 MHz. Slow Morse speed, ie "Novice" and "Intermediate" HF considerations are also not difficult. There is a case for allocation of all of the 3.5-3.7 MHz band to avoid band segment difficulties and there are complaints of overcrowding in the novice segment, however, the low sun spot cycle activity has contributed in part to this. Also, the WARC 79 amateur exclusive bands become genuinely exclusive in July 1989 and may ease pressure on novice segments. In the light of a WARC 92 position to seek additional band space above 3.7 MHz, it is proposed the "Novice" and "Intermediate" segment be extended to take in the entire 3.5-3.7 MHz band.

The second "Novice" and "Intermediate" HF band allocation worthy of adjustment is the 28 MHz band. There is no compelling reason why, with the FM emission mode available, this allocation should not be extended to take in all of the band permitting FM and repeater operation in the upper portion of the band.

The allocation of VHF/UHF spectrum to "Novice" and "Intermediate" licence grades is an issue which has been subject to much soul-searching in recent times. One outcome has been the near unanimous agreement on the need for a common band for all licence grades. As the 144 MHz band is the only allocation which can become a true common band, due to its utilisation and the proliferation of voice repeaters, it is recommended the full band be allocated, noting that emission mode and output power constraints identified earlier will apply.

To provide an alternative band and, to some extent, populate the 420 MHz band, it is proposed the CW, SSB and FM portion of that band from 432 to 440 MHz be also included in "VHF Novice" and "Novice" frequency allocations.

Whilst these allocations may appear at first considerable for "VHF Novice", the substantial difference between that proposed grade and the proposed "VHF Intermediate" remains a worthwhile incentive to upgrade.

TESTS AGAINST CONSTRAINING FACTORS

The preferred option above meets all National Authority requirements, furthermore, it is easily modified should WARC 92 vary the international Morse code considerations. It is well matched to equipment characteristics and does not offer great temptation to abuse mode, power or frequency constraints. It satisfies the requirement for a progressive series of licence grades with substan-

tial incentives for upgrading; it calls for a minimum of expensive testing and, in so doing, provides a range of entry points to match candidates qualifications and anticipated usage. Finally, the relationship between examination subject qualifications and licence privileges is clearly defined even though the precise details will need to be negotiated with the National Authority.

CONCLUSIONS

A detailed amateur radio licence restructuring option has been defined which satisfies all perceived constraining factors. It is simple, has a minimum number of grades, yet progression is clear and substantial incentives are provided for upgrading.

RECOMMENDATIONS

It is recommended the WIA adopt the preferred option for amateur licence restructuring identified above and seek its implementation at the earliest opportunity by the National Authority.

ar

VANDALISM

Telecom is taking action against a 13-year-old boy caught in the act of vandalising a public phone box in Western Australia.

His apprehension was the result of a deliberate campaign of many regular daily visits by Telecom officers to vandalism prone areas.

The boy was arrested and if convicted, the punishment could involve both the offender and his parents or guardians.

—Abridged from *Telecom WA News Journal* September 1987

FOR THAT SPECIAL RELATION OR FRIEND!

What better gift than membership of the Wireless Institute of Australia for one year?

Don't Delay — send now for information to:

CHRISTMAS PRESENT OFFER
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162

BANKCARD — VISA — MASTERCARD
Are available for your convenience

Registered Address: 3/105 Hawthorn Road, Caulfield North.

1988 MEMBERSHIP SUBSCRIPTIONS

MEMBERSHIP STATUS		VK1	VK2	VK3	VK4	VK5	VK6	VK7
FULL	"F"	39.50	37.50	49.00	40.00	40.00	37.00	38.00
ASSOCIATE	"A"	39.50	35.50	42.00	40.00	38.00	36.00	38.00
FULL (COUNTRY)	"C"	39.50	37.50	49.00	40.00	40.00	37.00	38.00
ASSOCIATE	"A"	39.50	35.50	42.00	40.00	38.00	36.00	38.00
PENSIONER	"G"	30.00	30.50	35.00	30.00	33.00	30.00	34.00
STUDENT	"S"	27.00	18.50	24.00	14.00	27.00	23.00	23.00
FAMILY	"X"	25.50	23.50	24.00	14.00	27.00	20.75	25.00
	JOINING FEE							5.00

CLASSIFICATION OF MEMBERS:

'FULL' is any amateur holding a call sign
'ASSOCIATE' is any amateur not holding a call sign (a listener)
'COUNTRY' in some Divisions there is a discount if you live in the country
'Pensioner' grade is an amateur holding a Social Security Health Card
'STUDENT' is a bona fide full time student requiring a signed statement from school/college/university headmaster/or person in authority
'FAMILY' member is an amateur who is at the same address as a member already receiving the magazine, in other words, you do not pay for the AR component.

Members can find their current status on their *Amateur Radio* label and their subscription notice.

The set of numbers on the top line of the label represents: first number 1-12 represents the join month eg 1 — Jan; the letter represents status eg F — Full; next number is Division eg 2 — VK2; next number represents the postal group; next numbers or letters are Zones, then follow the call sign and computer number.

If you have any queries about which particular grade you are in, please put it in writing to this office.

It is up to your Divisional Council to accept you as a particular grade of member, we can accept your payment and record your membership on the computer, but we pass any queries or disputes regarding grade to Divisions for their decision.

Some members have already taken the opportunity to use our new CARD facilities — Bankcard, Mastercard and Visa.

Equipment Review

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

MASPRO 144 MHz and 432 MHz YAGIS

The aerials presented for review were an eight-element 144 MHz Yagi, the 144WH8, and a 15-element 432 MHz Yagi, the 432WH15.

Assembling an aerial is often a trying and time-consuming task. Packets of screws and nondescript parts must be sorted and accounted for. Delightfully vague lists and drawings make the task even more difficult and invariably pieces are missing or the assembly sequence is incorrect!

The Maspro aerials are definitely not in this category. They are a lesson to other manufacturers in how to finish and package an aerial. The nuts have keepers and there are even a couple of spares thoughtfully provided for the absent-minded constructor who accidentally misplaces one.

The aerials fold and fit together with ease and a coaxial connector and sealing tape is provided. This is very useful for keeping water out of the coaxial cable.

These amateur aerials are fine examples of Maspro's workmanship and attention to detail. Maspro also produce a range of excellent television aerials.

The gain claims for these aerials are modest. Gain is rather difficult to measure, consequently no attempt was made to test the gain, however, results with the aerials were of the order expected.

The directivity, sidelobes and front-to-back ratios were all as one would anticipate and expect.

The standing wave ration was low within the amateur bands. On two-metres, an SWR of 1.1:1 was obtained and on 432 MHz the SWR was below 1.15. Both were in the narrow band mode area of the bands. Spot-checks within the well used areas of the band did not yield significantly higher SWR figures.

A Bird Model 43 Throughline Wattmeter with appropriate elements was used for the SWR checks.

Power rating of the aerials is given as 50 watts, but this would appear to be conservative. Operation at 100 watts did not show any distress or overheating.

The power rating is probably due to the use of thin cable between the coaxial connector and the actual aerial feed-point. A higher power rating could be possible if Teflon coaxial cable were used.

Both aerials have series UHF connectors for connection of the feedline. The reviewer feels that Type N connectors would be more appropriate. This is particularly so for the 432 MHz aerial.

Maspro have produced a pair of excellent aerials. They are delightfully simple to assemble. Packaging and design are first class. As a general station aerial they "fill the bill". Leave the Meccano sets to the weak signal specialists!

Both aerials are in the $100 price range.

There are Maspro agents in a number of States. For your nearest distributor contact Maspro Transbeam on (03) 762 6455.

ar

HERITAGE 200

Heritage 200 is a program developed and funded by the Australian Bicentennial Authority to pay tribute to Australians, both living and dead, who contributed most to making Australia what it is today. The nomination is to be accompanied by a brief summary of the person's achievements and supporting material.

A committee of three ex-WRANS were appointed to prepare and present a nomination of Mrs F V Wallace OBE, (Radio amateur 2GA, VK2FV).

The nomination was lodged with the Authority with 60 supporting items, including testimonials, certificates, newspaper cutting and quotations from other publications. In acknowledgment, the Authority stated that "the Committee intends to complete the selection process before the end of 1987".

SUBMISSION: Mrs Florence Violet McKenzie (nee Wallace), OBE, ASTC (Elec Eng), FAIN, RNARS, JP, lived for 90 of the 200 years we are now celebrating (1891-1982). She crammed many achievements into her lifetime and should be honoured in the bicentenary year for her very significant contributions to this country during peace and war. She was a pioneer in her chosen field of electrical engineering and the first woman in Australia to qualify as such in 1923.

She was widely respected by her peers and developed a firm friendship with Professor Albert Einstein who used to correspond regularly until his death in 1955. She played a major role in educating the community in both the dangers and advantages of electricity through publications and broadcasting. A pioneer in amateur radio, she was the first licensed woman radio operator and used her own station to contact other enthusiasts in islands throughout Oceania. This led her to explore all forms of communications. In 1939, when war was imminent, she could see how critical communications would be in world conflict and that many trained operators would be needed in a great hurry. She formed the Women's Emergency Signalling Corps, and when war broke out six months later, she had a fully operational school with 120 teachers and hundreds of others under instruction. Due to her foresight, Australia was more prepared for war than it would otherwise have been.

Her influence on the war effort is legendary — how she managed to cope with an ever increasing stream of servicemen, anxious to acquire vital skills in W/T communications before they could be accepted as trainee pilots leaving for Europe, or soldiers off to fight in the Middle East. When she realised the Navy was short of telegraphists, she harried the Royal Australian Navy into accepting some of her highly trained girls, thus forming the nucleus of the Women's Royal Australian Naval Service. Altogether she trained over 12 000 servicemen (including American, Dutch, Greek, Indian, Norwegian, Filipino and Chinese), in Morse, visual signalling and international code. She also trained 3000 girls, 1000 of whom went into the three Services. All tuition was free of charge and no financial support was ever received from Government sources. After the war the need for specialised training was just as urgent, as thousands of servicemen returned jobless and found that their skills did not fit them for the commercial world. Back they came to Mrs McKenzie who taught experienced fighter pilots to brush up on their Morse to be acceptable to Qantas and other airlines, also seamen who had to study for mate's and master's certificates for the Merchant Navy — in fact, anyone who needed these qualifications in a hurry. As always, where she saw a need she filled it — even studying and passing an examination in navigation as well as obtaining a First Class Radio Telephony Operator's Licence as some of the men required tuition in these subjects. She continued to give all this service free for a further 10 years until finally the airlines established their own school and the Government added a signal section to technical colleges. Mrs McKenzie has done it alone for 16 years! Her ability to open doors for thousands of young people, to train, guide and be mentor to them, has left her mark on the Australia we know today. She inspired all who passed through her hands and instilled qualities of dedication, loyalty and discipline which they in turn carried into their own fields of endeavour.

Mrs McKenzie was a true patriot and a great achiever who graced the 20th century and enriched it while adapting to the changing times. She used her extraordinary talents in the way she could see was best for her country and her contribution can never be measured.

—Reprinted from EX-WRANS DITTY BOX with thanks to Mrs Marjorie Taylor (Printer) and Mrs Heather Starr (Editor) for their permission to use this material. Contributed by Moira Millgate VK8NW (one of Mrs Mc's girls)

ar

Andrews Communications Systems

BUY FROM AUSTRALIA'S LEADING AMATEUR DISCOUNTER

GO ICOM NOW!

Full 12 months warranty on our ICOM

★ IC-761A DELUXE GENERAL COVERAGE Rx Tcvr **$4 500**
★ IC-R7000 25-2 000 MHz Professional Rx **$1 599**
★ IC-R71A HF COMMUNICATIONS Rx, 32ch MEM **$1 450**

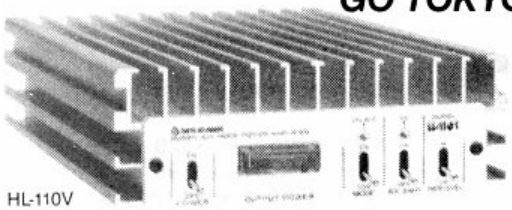
IC-735 $1499

Limited Time Only
HF ALL-MODE TRANSCEIVER, SUPERB RECEIVE SECTION, 100W 100% DUTY CYCLE TRANSMIT, 0.1-30 MHz Rx, PBT, NOTCH.

★ IC-475A 70cm base **$1 999**
★ IC-u4A 70cm handie **$525**
★ IC-PS55 20A pwr sup $495

★ IC-275H 2m base **$1 950**
★ IC-u2A 2m handie **$425**
★ IC-AT150 AUTO TUNE **$789**

GO TOKYO HY-POWER NOW . . .



HL-110V

★ HL-180V . . . $549

★ HL-66V 60W $279
★ HL-166V 160W ..... $POA
★ HL-1K/6 550W ..... $POA
★ HL-37V 30W $199
★ HL-62V 60W $299
★ HL-60V(3W) 60W $179

★ HL-85V 85W $399
★ HL-110V 120W $399
★ HL-160V25A 150W $449
★ HL-180V 170W $549
★ HL-30U 30W $349
(WELZ 500W LOAD $59!)

★ HL-60U 60W $479
★ HL-130U 110W ..... $POA
★ HL-250V, HL-250U, HL-1K HL-1K/2, HL-2K, INDENT
★ HC-200A, TUNER $339
PALOMAR LINEARS HERE

FT-209 (R)H w/FNB-4, c/c, **$579**

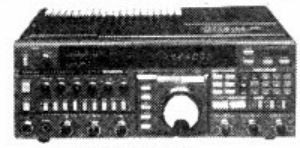
FT-23(R) micro 2m **$429** FNB-10 c/c, chgr **$130**

FANTASTIC FT-736(R) New 100 ch all-mode base, 2m/70cm/Sat included, 25W, satellite tracking. Optional 6m, 23cm, 10W. Indent . . . **$3250**

FRG965. . . **$1050** 60-905 MHz all-mode scanner 100 chs (SSB to 460 MHz) AC/DC

FRG-8800. . . **$1150** 150kHz-30MHz all-mode receiver, AC/DC, direct freq entry, 12ch mem. 12 months warranty.

FL-7000. . . **$3500** HF 1kW solid-state linear w/auto tuner, pwr supply. Indent.



FT-767GX HF. . . **$3650** Professional all-mode HF gen cov rx transceiver. Opt 6m, 2m, 70cm. Indent.

GO YAESU——NOW

EMOTATOR

HIGH QUALITY ROTATORS — DIRECT IMPORTER
★ 105TSX, 520kg/cm rotational, 3 000kg/cm braking torque inc round controller, top/bottom clamps. ONLY **$399**
★ 1200FXX, 2 000kg/cm rotational 18 000kg/cm braking torque, inc round controller. Limited stocks. ONLY **$899**

CORONA LINEAR AMPLIFIERS

★ HP80VDX, 2m, 80W, GaAsFET, meter .. **$299**
★ HP50UDX, 70cm, 50W, GaAsFET, meter **$399**
NEW THP 2m, HL-60V(3W) 60W amp **$179**

SCOOP PURCHASE

R.F.A. 7018GR . . . $99

70cm 18 element grid reflector folded dipole Yagi, 16.4 dBd,
★ 604Y 6m 4 element Yagi
~~$249~~ only **$99**

UNIDEN-BEARCAT SCANNERS

★ BC-50XL Economy hand-held **$229**
★ BC-100XL 16ch hand-held **$349**
★ BC-175XL 16ch base/mobile, AC/DC **$369**
★ BC-800XLT 800 MHz, coming soon.

JD150 TVI FILTER IN STOCK NOW!

Handles 1kW and has 5 sections for up to 60dB att. (Compare to Kenwood) **$49**

CHIRNSIDE ANTENNAS

CA-33 3el tribander, 4m boom **$399**
CA-34DX 4el tribander, 5m boom **$449**
CA-35DX 5el tribander, 6m boom **$499**
CA—5 S/S, 80-10m vertical, 6m **$179**

- KURANISHI FC-965 Up converter ... **$199**
- MALDOL HS-1300B Active ant **$249**
- TELEREADER CWR-880E Term **$550**
- TELEREADER FXR-550 FAX Term . **$750**
- R.F.AEROSPACE BEAMS from **$19**
- CONFIDENTIAL FREQ LIST No 3, ... **$19**
- WELZ meters SP.220 **$149.** SP.420 **$169** SP.122 **$179** SP.620 **$249** CT.530 **$57**
- KENWOOD TS-140S & TS-680S, soon.

CALL (02) 349 5792 or 344 7880 NOW!

SHOP 7, GARDEN ST, MAROUBRA JUNCTION, SYDNEY. NSW

THE MAIL ORDER SPECIALISTS. Write to: P.O. BOX 33, KENSINGTON, NSW. 2033

BANKCARD — MASTERCARD — VISACARD — AGC CREDITLINE
OPEN 6 DAYS

"BELOW COST CHRISTMAS SELLOUT"

ALINCO POWER SUPPLIES

EP-570 10V-15V DC Regulated 5.5A DC cont. 6.5A max — Was ~~$220~~ Now $159
EP-1510 10V-15V DC Reg 25A DC cont. 30A DC max 50% duty cycle. — Was ~~$399~~ Now $269
EP-2510 10V-15V DC Reg 25A DC cont. 30A DC max 50% duty cycle. — Was ~~$459~~ Now $299
EP-3030 10V-15V DC Reg 25A DC cont. 30A DC max 50% duty cycle. — Was ~~$549~~ Now $399

ADONIS

AD-1002 DIRECTION FINDER. Range 150 kHz to 4 MHz. — Below cost at **$500 complete.**

BLACK JAGUAR

BJ-200 HAND HELD SCANNER 26 MHz to 520 MHz — Was ~~$479~~ now $299

REGENCY

HX-1000 HAND HELD SCANNER 30 MHz to 512 MHz — Was ~~$449~~ Now $329

DAIWA PRODUCTS

CN-650 SWR METER 1.2-2.5 GHz. 2/20W FWD. 0.4/4W REF. N-type. — Was ~~$220~~ Now $150
CN-630M SWR METER 140-450 MHz. 50 ohm. 20/200W FWD. 4/40W REF. — was ~~$290~~ Now $190
CNW-419 TUNER 1.8-30 MHz Continuous. 17 Bands. 200W CW (3.5-30 MHz) 100W CW (1.8-3.4 MHz). — Was ~~$459~~ Now $299
CNW-518 TUNER 3.5-30 MHz. 8 Bands. 1kW CW. 50% duty cycle 20/200/1kW. — Was ~~$790~~ Now $499
PS-120 POWER SUPPLY 3-15V DC. 8A max. 12A max. — Was ~~$299~~ now $270
LA-2155H 2m LINEAR (144-148 MHz). Preamp gain 15 dB. Power Low 1.5W. High 25W. (In 25W — Out 150W) 13.8V. — Was ~~$559~~ Now $459
LA-4090 (430-450 MHz) Gain. 15 dB. In 10W — Out 85W. (In 25W — Out 90W) 13.8 V DC/25. — Was ~~$669~~ Now $529
VS-3 SCRAMBLER — Last One. — Was ~~$159~~ Now $99
LA-2035R (144-148 MHz) (In 1.5W Out 30W) — Was ~~$189~~ Now $129

PEARCE SIMPSON

T8-133 40ch UHF CB MOBILE. 5W Compact. — Was ~~$429~~ **EXCELLENT VALUE! Now $250**

TOKYO HY-POWER

HL-30U UHF 30W 430 MHz LINEAR AMP with GaAsFET receive preamp. FM, SSB, CW mode. — Was ~~$299~~ Now $199
HL-60U UHF 60W 430 MHz (5-60W) same specs as HL-30U. Many more features. — Was ~~$359~~ Now $289
HL-120U UHF 100W 430 MHz same specs as above. — Was ~~$829~~ Now $599
HL-85V 144 MHz ALL MODE LINEAR AMP — same specs as above (10-80W). — Was ~~$459~~ Now $390
HL-86V 50 MHz ALL MODE LINEAR AMP — same specs. (10-85W) — Was ~~$459~~ Now $390
HL-160V25 144 MHz ALL MODE (25W-150W). — Was ~~$659~~ Now $480
HL-725D 144 MHz/430 MHz COMBINED UNIT — same specs as above. — Was ~~$659~~ Now $499
HL-20U 430 MHz FM/SSB (2W-20W out). — Was ~~$199~~ Now $90

HAL

CT2200 TERMINAL. Receives & Transmits Baudot, ASCII, RTTY & Morse etc. Professional features — Was ~~$2000~~ Now $499
KB2100 KEYBOARD enable Split Screen Transmit & Receive. An excellent partner for CT2200. — Was ~~$599~~ Now $299

ESKA

RX99 PROFESSIONAL GEN COV. PLL synth. AM/SSB COMMUNICATIONS RECEIVER. — Was ~~$1900~~ Now $900

SANSEI

D-5000 SCRAMBLER, Digital, used for all mode Transceivers. Excell voice quality, high stability, etc. — Was ~~$4500~~ Now $3500

TAIYO

TD-L1626 DIRECTION FINDER, highly professional system complete with flat ant etc. — Was ~~$25 000~~ Now $17 000

GOODWILL

GDM-8035 DIGITAL MULTIMETER bench type. — Reduced below cost **$99 only.**

TELEREADER

CD-670E DIGITAL DECODER — for CW (Morse code), Baudot, ASCII & TOR/ AMTOR, RTTY, etc. — Was ~~$629~~ Now $399
CWR-860E DECODER for any Data currently used in Radio Communication/ built-in Printer Interface — Was ~~$599~~ Now $299

"BELOW COST CHRISTMAS SELLOUT"

TONO

THETA-777 DECODER for AMTOR, RTTY & CW and has complete software for Communication Rx/Tx etc. — Was ~~$729~~ **Now $499**

TASCO

FX550 COMPUTER CONTROLLED VIDEO FACSIMILE PROCESSING SYSTEM — Latest Technology. — Was ~~$899~~ **Now $799**

WELZ

SP-600 SWR & P/METER 1.6 to 500 MHz. Has 3 built-in sensors. 20W/200W/2000W Range. — Was ~~$389~~ **Now $349**

DRESSLER

RPA-70 GaAsFET Rx PREAMP. 70cm. — Was ~~$109~~ **Now $49**

VV INTERFACE REMOTE UNIT for power supply & switching of M/Mounted preamps via Coax Feeder — Was ~~$59~~ **Now $20**

EVV700 M/Mounted PREAMPS 70cm Low Noise — Was ~~$299~~ **now $279**

EVV2000 M/Mounted PREAMPS 144 MHz Low Noise — Was ~~$299~~ **now $279**

DATONG

SRB-2 AUTO NOISE BLANKER — Blanks noise from any Receiver or Transceiver — Was ~~$299~~ **Now $95**

DF + DFAI DIRECTION FINDING SYSTEM for existing narrow band FM Receivers & Transc. — Was ~~$599~~ **Now $350**

ANF AUTO NOTCH FILTER. 3 Filters in one incl CW. Var Low Pass. Var High Pass & Notch. — Was ~~$239~~ **Now $139**

VLF Adds Low Frequency coverage to exist. Communication Receivers — Was ~~$129~~ **Now $99**

RFA Improves sensitivity & Signal to Noise Ratio of Receivers & Transceivers 5-200 MHz. — Was ~~$149~~ **Now $129**

KDK

FM-240 2m MOBILE. 25W High. 5W Low. 16 memory plus call. All programmable. Has all features. GREAT VALUE. — Was ~~$579~~ **Now $399**

SP-225 SWR & P/METER 1.8 to 200 MHz. Has 1 built-in sensor. Range 1W/3W/30W. — Was ~~$249~~ **Now $229**

SP-425 SWR & P/METER 140-525 MHz. Has 1 built-in sensor. Range 1W/3W/ 30W. — Was ~~$259~~ **Now $240**

RS-3000 POWER SUPPLY 13.8V dual outputs 30A/10A. 50% duty cycle. Ripple 0.2 mV. — Was ~~$490~~ **Now $340**

RS-3050 POWER SUPPLY 3V to 15V dual outputs 30A/10A. 50% duty cycle,etc. — Was ~~$589~~ **Now $450**

ANTENNAE

CREATE 2X713 (430 MHz) 2 x 13 element Yagis compl W/Phasing Harness. — Was ~~$319~~ **Now $199**

CREATE X211 (144 MHz) 11 element Yagi. — Was ~~$299~~

CREATE 2X211 (144 MHz) 2 x 11 elem Yagis compl with Phasing Harness. — Was ~~$425~~ **Now $359**

TET

TE-11F3J 3 el. 27 MHz Base Beam Antenna — Was ~~$159~~ **Now $129**

HB 23M 2 el 3 band (20, 15, 10) Beam — Was ~~$369~~ **Now $299**

CHIRNSIDE

CA-33 3 el Triband Beam (20, 15, 10) — Was ~~$429~~ **Now $359**

CA-35DX 5 el Triband Beam (20, 15, 10) — Was ~~$529~~ **Now $459**

CONNECTORS GALORE . . . 2 pin, 3 pin, & 4 pin — **@ $1 each**

CUSTOMERS NOTE: We are now taking bookings for buses from Melbourne & Brisbane for the Gosford Hamvention. Ring now & book.

CORRESPONDENCE: BOX K21, HAYMARKET, NSW. 2000

EMTRONICS

MAIL ORDERS WELCOME

NSW & HEAD OFFICE:

92-94 Wentworth Ave, Sydney
NSW. 2000. TLX:AA73990
P.O. Box K21 Haymarket, NSW. 2000.
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:

288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St.)
Ph: (03) 670 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:

416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
Ph: (07) 394 2555
FAX: (07) 39 4316

AMSAT UK/UOSAT SPACE COLLOQUIUM

July 17-19, 1987

University of Surrey, Guildford, Surrey, England

Graham Ratcliffe VK5AGR
AMSAT-Australia National Co-Ordinator
PO Box 2141, GPO, Adelaide, SA. 5001

At 11.30 am, Wednesday, July 8, I departed Adelaide, 28 hours and 55 minutes later I arrived at London Heathrow after brief stopovers in Sydney, Singapore and Muscat.

I was met at Heathrow by James Miller G3RUH, with whom I spent the next five days at his home in the village of Coton, a few kilometres south-west of Cambridge. James is a well-known figure to those interested in the Amateur Satellite Service as the designer of an excellent range of satellite telemetry decoders for UoSAT OSCAR 9 and 11, OSCAR 10 and Phase IIIC, and a modem fro Fuji OSCAR 12. He is also recognised for his software for tracking OSCAR 10 (PLAN10) and a wide range of support software for determining spacecraft attitude and solar illumination planning. It was primarily for this reason that I took the opportunity to spend a few days with James prior to returning to London to spend the next three days with Ron Broadbent G3AAJ, Honorary Secretary of AMSAT-UK.

When I left for London on an economy airfare, with a 20 kilogram baggage limit, I had 13 kilos of amateur satellite equipment in my suitcase, namely, an OSCAR 10 Integrated Housekeeping Unit (IHU, alias computer), an Atari 800XL Command Computer, an AMSAT Atari Cassette Interface and a Cassette Recorder. The purpose of toting this equipment halfway around the world was to help James understand what is involved in commanding OSCAR 10 and Phase IIIC after launch in early 1988. As previously mentioned, James had already written a large suite of Command Station support software and, I hope, as a result of demonstrating Command Station activities first-hand he will develop even more sophisticated software for the support of Phase IIIC activities, particularly in the area of telemetry capture, storage and analysis on an IBM-PC, not only for Command Stations, but any interested individuals.

At the end of five days I am sure he had a much greater understanding of Command Station activities and requirements. Since my return from the UK, I have received an excellent program for decoding OSCAR 10 and Phase IIIC Phase Shift Keyed (PSK) telemetry using the ever-popular Commodore 64, from James. For further details on this software, send an SASE to AMSAT-Australia, C/- Box 2141, GPO, Adelaide, SA. 5001.

On Tuesday, July 14, I caught a train from Cambridge to London to spend the next three days helping Ron prepare for the Colloquium. Well, within minutes of arriving at Ron's home at Wanstead Park he had me collating the handouts and name badges for the 180 attendees at the Colloquium. The next project was to collect together literally a truckload of books, software, badges, ties and other AMSAT-UK paraphenalia for sale at the Colloquium. This kept us both extremely busy for the next three days but gave us both the opportunity to discuss the problems and frustrations common to supporting an amateur satellite user community whether in the UK or Australia. Ron gave me many good tips on how to handle a wide range of different inquiries and potential sources of various information.

One evening, Ron arranged a visit to the shack of Trevor Stockhill G4GPQ. This visit was rather rewarding for AMSAT-Australia as Trevor donated an IBM-PC mother-board, multi-function, monochrome and EGA graphics and a floppy disc controller card for a VHF Remote Bulletin Board Service (RBBS) to be set-up in the Adelaide area. This will allow me to leave messages down-loaded from the Digital Communication Experiment (DCE) on UoSAT OSCAR 11 and receive messages for up-loading to the DCE. This project is well underway and, by the time you read this report, messages for transfer to the UK, US and New Zealand via the DCE can be forwarded to your local VHF BBS who will then forward them to the Adelaide BBS via the HF BBS Network. The ability to send packet messages via my station acting as a 'DCE Gateway' has been operational since April 1987, and many VK amateurs have already availed themselves of the opportunity to send messages to other amateurs in the UK. At the time of writing this report, a typical path to me would be via VK4BBS, VK6AGC, VK2TOP or VK3BSR BBSs to VK5ZK BBS, all on HF to VK5AGR BBS on VHF and then to the DCE on UoSAT OSCAR-11. The VHF RBBS in Adelaide will replace VK5AGR BBS with Garry VK5ZK, still acting as the HF Gateway to the Adelaide RBBS.

On Friday, Ron and I set off for the University of Surrey (UoS), at Guildford, in a light commercial van bursting at the seams with Amateur Satellite information. After negotiating the rather hectic London traffic we had a relatively leisurely drive through the English countryside to Guildford. Upon arrival at the UoS we unloaded what had taken three days to accumulate, and in three hours we had set-up an AMSAT-UK stand in a room near the main lecture theatre. We concluded just in time to start registration of the first attendees who arrived about 6 pm. Right from the outset it was obvious that, although this was an 'amateur' function, the whole weekend was run very 'professionally'. It is heartily recommended that, if you ever have the slightest opportunity to attend an AMSAT-UK Space Colloquium, make every effort to do so as you will never regret it.

Accommodation was provided on campus in the student quarters which were extremely comfortable and more than adequate for the few hours sleep afforded amongst all the activities. The only criticism of the entire weekend was the perennial "you could not be in two places at the same time." By this I mean that on a number of occasions there were two sessions being conducted concurrently as there were so many topics to be covered. As a result, the next Colloquium will be held over three days.

The individual sessions were excellently structured so that each session began with an introductory presentation. This presentation ensured that even the newcomer to a particular aspect could understand the following presentation — quite an achievement.

For instance, the first session began with a presentation by Craig Underwood G1WTW, entitled *Introduction to Amateur Satellites in Practice.* In this presentation Craig set the scene by explaining most of the dialect used by amateur satellite operators and went through the meaning of all those dreadful acronymns the keep appearing which most newcomers find rather baffling. This was followed, logically, by a presentation on *Tracking Topics* by James Miller G3RUH. The next step was to cover *Operating on Mode B, J and L Transponders.* This was my presentation and was particularly directed at helping the newcomer. (If any readers would like a copy of the transcript of this presentation, please send an SASE to the above address).

The second session after lunch (the food was excellent!), described the amateur satellites. Jacky Radbone G1WJN, began the session with an overview of the UoSAT Spacecraft Operations and Results of Experiments on UoSAT OSCAR-9 and 11. Then Dave Rowan G4CUO gave a presentation on the building and launching of Fuji OSCAR-12, accompanied with colour slides. Dave had to step in at very short notice when Miki JR1SWB could not attend the Colloquium. Karl Meinzer DJ4ZC concluded this session by presenting an AMSAT Phase IIIC/D Status Report. Karl did not spend very much time on the Phase IIIC project because, at that stage it was on hold pending the successful launch of the next Ariane rocket. Also, Karl was rather eager to present the new and exciting Phase IIID project. During Karl's presentation you could hear a pin drop as everyone in the auditorium was enthralled. Suffice to say that many listeners would now prefer that Phase IIID, rather than Phase IIIC was scheduled for launch early in 1988! (If you would like a copy of the AMSAT-DL Phase IIID brochure, send an SASE to AMSAT-Australia).

Briefly, Phase IIID is planned to be launched into a 63.4 degree inclination orbit with a perigee height of 1500 km and a period of 720 minutes and it will have a high-powered Mode L transponder which should enable operators to work Mode L mobile.

The post-afternoon session was divided into two streams — the A-stream continued on from the previous session, ie the Future Amateur Satellites, while the B-stream covered Satellites in Education. I chose to attend the A-stream which began with a most entertaining and informative presentation on the Soviet Space Program, by Geoff Perry, of Kettering Boy's School fame. Transcripts of this presentation are available from AMSAT-Australia for an SASE as above.

Next, Martin Sweetin G3YJO, discussed the UoSAT-C program, another in the UoSAT educational and scientific satellites. The final presentation before dinner was given by Vern Riportella WA2LQQ, President of AMSAT-North America, on the AMSAT Phase IV Plans. Rip was standing in for Jan King W3GEY, the AMSAT-NA Vice-President of Engineering who unfortunately could not attend due to last-minute work commitments.

Rip gave an excellent presentation, however, it was almost immediately obvious from audience reaction that the Phase IV Project (ie two geosynchronous satellites) offering 24 hour service using a hand-held, was not a welcome concept to the majority of Europeans attending the Colloquium. Most equated the Phase IV Project with a repeater in the sky, and this was the last thing the European community needed. Also, to my surprise, the concept of justifying the Phase IV Project on the basis of providing emergency communications seemed to be rather alien to the European community. The main justification for the Amateur Satellite Service in the eyes of the European community is for education purposes and to provide operators with some challenges.

After dinner, the AMSAT-UK Annual General Meeting was held in the auditorium, and lasted

less than 30 minutes. The meeting was then thrown open for general discussion which immediately centred on Phase IIID versus Phase IV. Ironically, neither Rip WA2LQQ or Karl DJ4ZC, were present so the discussion was quite open. With few exceptions, most countries represented favoured Phase IIID in preference to Phase IV. This rather 'heated' discussion went on for at least two hours and left no doubt in my mind that the Phase IIID project was preferred in Europe and throughout most of the world. Other than obvious support from attendees from the US, I can only recall South Africa and South America supporting the Phase IV project.

On Sunday, the A-stream dealt with digital data transmission techniques and the B-stream covered RS Satellites — Propagation, UoSAT OSCAR-9 Orbital Decay and Weather Satellites. I attended the A-stream which began with Jeff Ward G0/K8KA, giving an Introduction to Packet, James Miller G3RUH on Modulation Schemes and Modems, and a most enlightening lecture on Using RUDAK on Phase IIIC, by Hanspeter Kuhlen DK1YQ. This session concluded with an AMSAT OSCAR-10 Status Report, by Ian Ashley ZL1AOX. Jeff Ward concluded the digital data transmission presentations after lunch by *The Digital Communications Experiment* (DCE) *Gateway Network*. Again, I have information on all of these topics which may be attained by sending an SASE to AMSAT-Australia.

The rest of the afternoon was scheduled for open discussion, and once again it centred on the pros and cons of Phase IIID and Phase IV projects. This time both Karl and Rip were present and it gave them both an opportunity to debate the topic point for point. Once again Karl's approach fitted the European way of thinking whereas Rip's ideas seemed only to alienate most. I was very pleased not to be in Rip's shoes, having to face such formidable opposition to the Phase IV proposal. I did ask Rip as to the proposed source of the US$10 million to conservatively finance such an ambitious project. His answer left most in doubt as to the availability of such funds except from "selling off" space on these satellites to non-amateur groups, which again was not received well by the European community.

I was very impressed by the presentations at the Colloquium but I felt that the real benefit of attending the Colloquium came from meeting and exchanging ideas with attendees from the many different countries around the world. I cannot recall exactly how many countries were represented, but there were attendees from Germany, Italy, Austria, Sweden, Yugoslavia, South Africa, North and South America, Hong Kong, New Zealand and Australia to name a few.

Already, since my return, I now receive reciprocal newsletters and magazines from a number of different countries. However, the weekend, like all events, was too short and I did not have time to speak with as many as I would have liked. This was made particularly difficult because, as a presenter, many of the attendees wanted to "pick your brains" which left even less time to catch up with other speakers myself. I did, however, manage to have discussions with Craig Underwood and Jeff Ward to arrange exchange between schools in the UK and Australia, via the DCE on UoSAT OSCAR-11.

I also arranged with Martin Sweeting to obtain CCD Camera decoding software for the IBM-PC as soon as the bugs have been ironed out at the UoS.

Finally, I arranged to meet Karl in Marburg for a couple of days prior to returning home.

After returning to London and helping Ron unpack and stow away all the remaining AMSAT-UK paraphenalia from the Colloquium, I departed for Marburg on Tuesday, July 21. I flew to Frankfurt and then caught a train to Marburg. To my surprise, when I arrived at the AMSAT-DL Laboratory, I was met by Frank VK6DM, from Albany. This turned out to be rather fortuitous as Frank had brought his video camera and with Karl's permission and Werner Haas DJ5KQ, as our guide, we were allowed to photograph Phase IIIC in the 'clean room.' Thanks to Franks efforts, AMSAT-Australia has an excellent 15 minute video with me describing all the systems on Phase IIIC, which it is hoped will be of interest to readers. To obtain a copy of this video (VHS format only) send a blank 30 minute VHF cassette and return postage, plus a small donation, payable to AMSAT Australia.

During the Colloquium, several plaques were presented for services to AMSAT and OSCAR-10 command. Graham was one of the recipients. From left: ZL1AOX, DK1YQ, DB2OS and Graham VK5AGR.

The next day Frank left to continue his trip around Germany, which left me with the opportunity to discuss many topics with Karl in the relaxed atmosphere of Marburg. Of top priority was Karl's request that I produce a paper on the significance of the Phase IIID versus the Phase IV orbit with respect to operations for those in the Southern Hemisphere and, in particular, Australia. This paper is currently under preparation and has already brought to light some interesting possibilities. On that subject, Karl suggested, that as the perigee will occur in the Southern Hemisphere, that Phase IIID could be used for special experiments to take advantage of perigee operation. In particular, Karl would like to see a proposal from amateurs in Australia and/or New Zealand for an experiment to utilise Phase IIID during the perigee part of the orbit. If you have any such ideas, however wild they may seem, let me know as there is an excellent chance that such an experiment could fly on Phase IIID. The experiment does not necessarily have to be complex but something new and innovative would be an advantage. Karl has also asked me to see if I could investigate the degradation of the solar panel efficiency on OSCAR-10 over its lifetime from launch to when the PSK telemetry failed. To do this I need good quality tape recordings of raw OSCAR-10 PSK telemetry — any starters?

Karl and I also discussed what PIIIC will mean for those located in the Southern Hemisphere. In particular, depending on the final argument of perigee, ie 225 would be much more preferable than 270. To sum up my discussions with Karl, I would say that Karl is very conscious of the wishes of the Australian amateur satellite operator and would be very pleased to see Australian amateurs provide an experiment to fly on Phase IIID.

After Marburg, I returned to London for a few hours before departing for home, via Singapore and Perth. Fortunately, I was able to have a seven day stopover in Perth, which gave me the opportunity to visit Albany and give a presentation on Phase IIIC to the local radio group. Similarly, I had the opportunity to give a similar presentation on OSCAR-10 to members of the WA VHF Group, in Perth. I would like to thank both groups for their excellent hospitality.

Finally, I would again like to recommend that, if you ever have the opportunity to attend n AMSAT-UK Colloquium, do not let the opportunity pass. You will not regret the decision to attend!

Also, as mentioned several times in this report, I have collected quite a number of "bits and pieces" and photocopies are available for any particular item from AMSAT-Australia for the cost of an A4 size SASE with a 95 cent postage stamp (ie 100 gram Airmail postage). In this report I have only had the opportunity to briefly mention most topics, therefore, if you would like to discuss any topic you are welcome to contact me on the AMSAT-Australia net any Sunday night at 1000 UTC, on 3.685 MHz, or alternatively out of working hours on (08) 297 5104.

ar

QSP

AIRCRAFT PHONES

Telecom plans to have an in-flight telephone service started by the end of 1988.

Initially air travellers will be able to make telephone calls from above south-eastern Australia to anywhere in the world.

Using a telephone handset from a unit mounted either on a wall of the plane or in a seat, a passenger will pay for their calls using a plastic credit card.

The service is expected to be especially attractive to business people, who were the main users of aircraft telephones in Canada and the United States.

Current cellular telephones are not permitted to be used on Australian aircraft because they interfere with aircraft navigation and communication equipment.

ANNUAL INDEX FOR AR — 1987 . . . Volume 55

MORSE CODE

NEW PRODUCTS

NOVICE NOTES with Drew Diamond VK3XU

PACKET RADIO

REPEATERS/BEACONS

TECHNICAL

THUMBNAIL SKETCHES

TRANSCEIVER/RECEIVERS/TRANSMITTERS

TRY THIS

KENWOOD

SUPER SUMMER SPECIALS

KENWOODS' GREAT IN '88
$3800

TS-940S
HF TRANSCEIVER

The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 kHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 kHz spacing, 500 Hz CW bandwidth). Engineered with the serious DX'er/contest operator in mind, the TS-940S features a wide range of innovative interference rejection circuits, including SSB IF slope tuning, CW VBT, IF notch filter, AF tune circuit, Narrow/Wide filter selection, CW variable pitch control, dual-mode noise blanker, and RIT plus XIT.

KENWOODS' GREAT IN '88
$1995

TS-440S
HF TRANSCEIVER

The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 kHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT.

TL-992
HF LINEAR AMPLIFIER

KENWOODS' GREAT IN '88
$2000

The TL-922 is a band linear amplifier designed to provide maximum legal performance, utilising two 3-500Z high performance transmitting tubes. Incorporates class AB_2 round-grid amplifier circuit. Excellent IMD (intermodulation distortion characteristics).

VALVES NOT INCLUDED

KENWOOD

SUPER SUMMER SPECIALS

TS-140S
HF TRANSCEIVER

The TS-140S is a high-performance HF transceiver designed for SSB, CW, AM and FM modes of operation on all Amateur bands. It incorporates an outstanding 500 kHz to 30 MHz general coverage receiver with superior dynamic range, combining the ultimate in compact size with advanced technology.

All-Mode operation (includes USB, LSB, CW, AM and FM)
Compact and lightweight. Measures only 270 Wx96 Hx270mm and weighs only 6.1kg (13.45lbs). CW Full Break-In, Semi Break-In and VOX Circuit. Superior receiver dynamic range. The receive front end has been specifically designed to provide superior dynamic range. The intermodulation dynamic range is 102dB, with an overall intercept point of +12dBm, noise floor level of—138 dBm. (when the optional 500 Hz CW filter YK-455C-1 installed). 31 Memory channels with split memory channels and memory scroll. Built-in dual-mode noise blanker ("Pulse" or "Woodpecker"). IF shift circuit. Adjustable VFO tuning torque. Switchable AGC circuit (FAST/SLOW) and built in speech processor. RF output power control and "F.LOCK" switch. Non-volatile operating system. Fluorescent tube digital display and squelch circuit (for FM mode). RF power output — SSB=110W, CW=100W, FM=50W and AM=40W.

KENWOODS' GREAT IN '88
$1532

JUST ARRIVED

TS-680
HF TRANSCEIVER

NEW FOR 88

Includes all the above features for the TS-140S
PLUS

Covers Amateur bands.
Six metres to 160 metres.
Six metres 10 watts output.
Other HF Bands 100 watts output.

KENWOODS' GREAT IN '88
$1584

KENWOOD

SUPER SUMMER SPECIALS

RZ-1 WIDEBAND RECEIVER

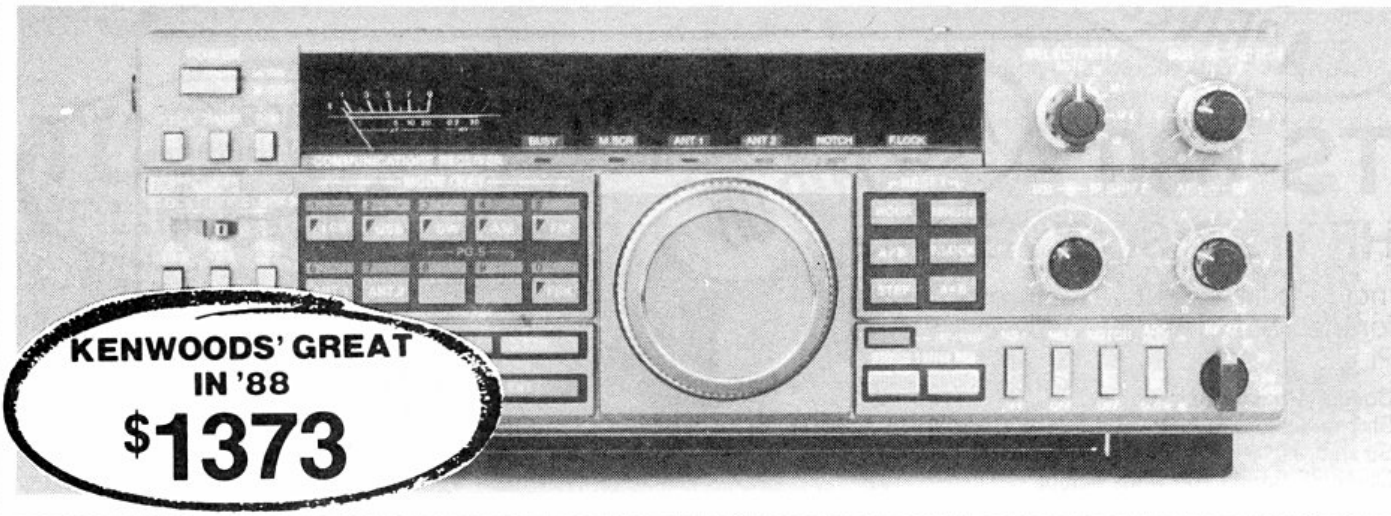
Features: Wideband Frequency Coverage (500KHz — 905MHz), including FM Stereo Broadcast and Multi-Channel Television Sound. 100 Easy-To-Operate Multi-Function Memory Channels with Message Capability. 10-Band Programmable Capability. Keyboard Frequency Selection. Auto-Mode and Auto-Step Operations. Multi-Scan Function. Easy-To-Read Large LCD Display. Compact and Lightweight. Auto-Selectable Dual Antenna Terminals. Built-in speaker. Front-mounting phones jack. Easy-to-operate, illuminated keys. Accessory terminals are Line Out/Video Out/External Speaker Terminal. Squelch circuit for FM (narrow) mode. UP/DOWN Keys for VFO and memory channel.

Specifications Frequency Range: 500KHz — 905MHz Mode: A3[A3E] (AM), F3[F3E] (FM) Circuitry: AM, FM(N) = Triple conversion system FM(W) = Double conversion system Sensitivity: AM (S+N/N = 10dB) = Less than 5 uV (BC band 10uV). FM (N) = 12dB SINAD less than 6uV (500KHz — 60MHz) less than 3uV (60 — 905MHz). Operating Temperature: -10° - +60°C. Audio Output Power: 2W (at 8 ohms load 10% distortion). Current Drain: Less than 1A (audio power output 1W). Antenna Impedance: 50 - 300 ohms. Power Requirement: 13.8VDC ± 15%. Dimensions: 180(W) x 50(H) x 158(D) mm. Weight: 1.5kg.

R-5000 COMMUNICATIONS RECEIVER

The R-500 is a competition class communications receiver with superior dynamic range, having every conceivable feature, and is designed to receive all modes (SSB, CW, AM, FM, FSK) from 100 kHz to 30 MHz. With the optional VC-20 "VHF Converter Unit" coverage of the 108—174 MHz frequency range is provided.

Advanced microprocessor technology controls various features, including dual digital VFOs, 100 memory channels, memory scroll, memory and programmable band scan, superb interference reduction and other features for ease of operation to enhance the excitement of listening to stations around the world.



KENWOOD

SUPER SUMMER SPECIALS

TR-751A TR-851A

2 METER **70CM**

ALL-MODE TRANSCEIVERS

The new TR-751A 2-m and TR-851A 70-cm all-mode transceivers deliver superior performance and "All Mode Mobility". Packed with all the most often needed features including auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel, programmable CTCSS tone, various scan functions, all-mode squelch, noise blanker, RIT, DCL (Digital Channel Link) and easy-to-operate front panel layout. And, designed with the latest state-of-the-art technology, this compact rig is the one to choose for VHF or UHF stations on-the-go.

KENWOODS' GREAT
TR-751A **IN '88** TR-851A
$963 **$1122**

TS-711A TS-811A

2 METER **70 CM**

ALL MODE TRANCEIVERS

Features enhanced ease of operation through the use of new microprocessor technology that permits the incorporation of the widest range of innovative features in a very compact package. These features include KENWOOD's new, exclusive DCS (Digital Code Squelch), 10-HZ step dual digital VFO's, a new, multi-funtion fluorescent tube digital display, 40 multi-function memory channels, programmable band scan, memory scan, mode scan, auto mode function, "Quick-step" main tuning dial, IF shift, speech processor, all-mode squelch, noise blanker, and an easy-to-operate front panel design.

KENWOODS' GREAT
TS-711A **IN '88** TS-811A
$1620 **$1885**

TM-221A TM-421A

2 METER **70 CM**

FM MOBILE TRANSCEIVER

Specifically designed to condense maximum performance and operating convenience into an ultra compact package, allowing maximum flexibility in automotive installations.
In addition to a powerful 45 watts (TM-221A) and 35 watts (TM-421A) of RF output power, convenient key features include a large new easy-to-read LCD display, digital VFO with frequency step size selection, 14 multi-function memory channels, extended frequency coverage, pre-programmed automatic offset (TM-221A), memory scan and programmable band scan, memory shift function, and others for ease of operation and added versatility.

KENWOODS' GREAT
TM-221A **IN '88** TM-421A
$555 **$587**

TM-2570A

2 METER

FM MOBILE TRANSCEIVER

Has been designed to satisfy the needs of the most demanding 2m mobile operator. A wide range of innovative features have been incorporated in the basic design, including a large, new, easy-to-read LCD display, 23 multi-function memory channels for storing frequency, offset, telephone number and auto-offset.

KENWOODS' GREAT IN '88
$910

HIGH POWER 70 WATTS MOBILE

KENWOOD

SUPER SUMMER SPECIALS

TH-205A TH-405A

2 METER **70CM**

FM HANDHELD TRANSCEIVERS

FEATURES	TH-205A	TH-405A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	430 MHz-440MHz
MEMORY CHANNELS	3	3
KEYBOARD ENTRY	NO	NO
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W x 180H x 40D	70W x 180H x 40D
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
OPTIONS (see your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

TH-215A TH-415A

2 METER **70CM**

FM HANDHELD TRANSCEIVERS

FEATURES	TH-215A	TH-415A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	430 MHz-440MHz
MEMORY CHANNELS	10	10
KEYBOARD ENTRY	YES	YES
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W x 180H x 40D	70W x 180H x 40D
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
OPTIONS (see your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

TH-25A TH-45A

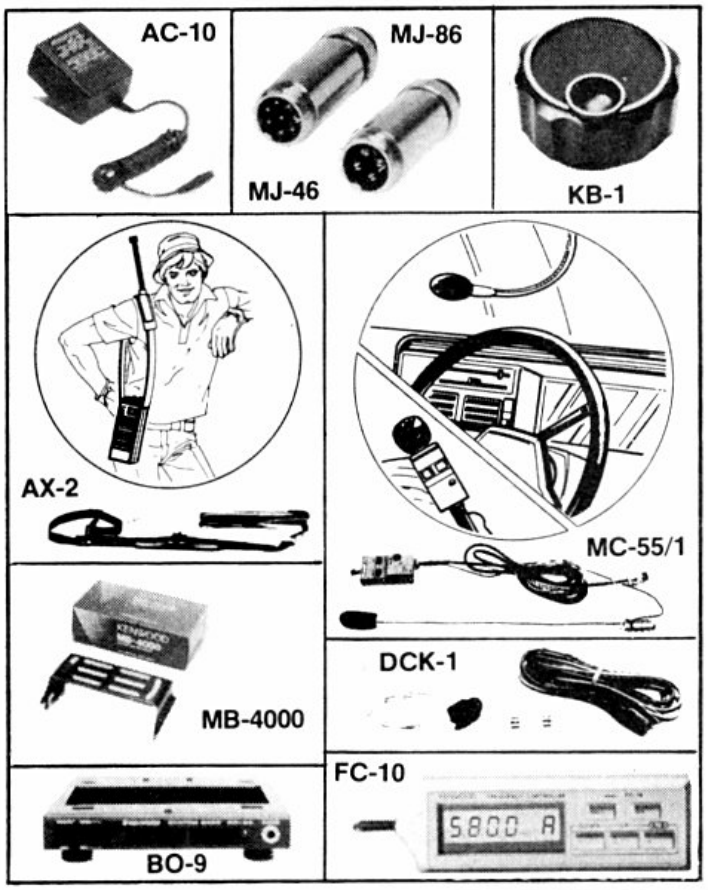
2 METER **70 CM**

FM POCKET TRANSCEIVERS

Ultra compact, slim and lightweight FM pocket/hand held transceivers designed to condense maximum performance and operating convenience into a single compact package.

SEE YOUR DEALER FOR FULL DETAILS

KENWOOD SUMMER CLEARANCE



AC-10	AC Adaptor for the CD-10	$10
AX-2	Shoulder Strap for Hand Held Transceivers with Antenna Base	$10
BO-9	System Base for TR-9000/9500	$10
BS-5	Adaptor to connect TS-520 series to SM-220	$25
DC-25	DC Converter for TR-2500/2600	$25
DCK-1	DC Cable Kit for R-600/2000	$5
FC-10	Frequency Controller TM-201/401	$25
IF-10A	Computer Interface for TS-711/811	$50
IF-10B	Computer Interface for TS-940	$50
KB-1	Deluxe VFO Knob TS-830/530 VFO-240	$5
KS-038	Clamp for KR-400 Kenpro Rotator	$5
MB-4000	Mobile Mount for TW-4000	$10
MC-55/1	Mobile Microphone	$40
SWC-3	Coupler for SW-2000 1.8 — 54MHz	$20
MJ-46	Mic. Plug Adaptor (4 Pin — 6 Pin)	$5
MJ-48	Mic. Plug Adaptor (4 Pin — 8 Pin)	$5
MJ-64	Mic. Plug Adaptor (6 Pin — 4 Pin)	$5
MJ-68	Mic. Plug Adaptor (6 Pin — 8 Pin)	$5
MJ-84	Mic. Plug Adaptor (8 Pin — 4 Pin)	$5
MJ-86	Mic. Plug Adaptor (8 Pin — 6 Pin)	$5

KENWOOD CLEARANCE ITEMS ABOVE ARE ONLY AVAILABLE FROM KENWOOD ELECTRONICS, 4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066 EITHER BY COUNTER SALE OR MAIL ORDER ONLY (PLEASE ADD FREIGHT)

All merchandise on the preceeding 5 pages is available from all the Kenwood Electronics Distributors listed below.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

Further beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

N.S.W.:
EMTRONICS — 94 WENTWORTH AVENUE, SYDNEY (02) 211 0988
REG STOCKMAN COMMUNICATIONS — CNR BANOCKBURN ROAD & SHIRLEY STREET, INVERELL (067) 22 1303
WORMALD COMMUNICATIONS — 51 DENNISON STREET, HAMILTON, NEWCASTLE (049) 69 1999
MACELEC PTY. LTD. — 99 KENNY STREET, WOLLONGONG (042) 29 1455
ALEX JOHNSON — 19 BANKSIA STREET, O'CONNOR, A.C.T. (062) 47 9125
DX ENGINEERING — 158 GRANITE STREET, PORT MACQUARIE (065) 84 9922
FRANK BOUNDY — LISMORE (066) 86 2145

INTERSTATE

VIC.:
PAPAMETERS PTY. LTD. — 1064 CENTRE ROAD, SOUTH OAKLEIGH (03) 575 0222
EMTRONICS — SHOP 5 TO 7, 288-294 QUEEN STREET, MELBOURNE (03) 670 0330
BRIAN STARES — 11 MALMSBURY STREET, BALLARAT (053) 39 2808
SUMNER ELECTRONICS — 78 KING STREET, BENDIGO (054) 43 1977

TAS.:
WATSONS WIRELESS — 72 BRISBANE STREET, HOBART (002) 34 4303
MARINE & COMMUNICATION — 19 CHARLES STREET, LAUNCESTON (003) 31 2711

QLD.:
V.K. ELECTRONICS — 214 MOUNT STREET, BURNIE (004) 31 7733
MITCHELL RADIO CO. — 59 ALBION ROAD, ALBION (07) 357 6830
EMTRONICS — 416 LOGAN ROAD, STONES CORNER, BRISBANE (07) 394 2555

S.A. & N.T.:
INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD. — 8 NILE STREET, PORT ADELAIDE (08) 47 3688

W.A.:
WILLIS ELECTRONICS — 165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
BAY RADIO — 22 GRACE STREET, FERNDALE (09) 451 3561
FORD ELECTRONICS — UNIT 19, 70 ROBERTS STREET, OSBORNE PARK (09) 242 1766

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria* [1]
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns* [2]
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany* [3]
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne* [4]
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1. Advice has been received from Hal Lund ZS6WB, that a new six-metre beacon will be operating from September 20, 1987, on 50.0225 MHz running 60 watts to a six-element Yagi at 50 feet with CW identification "ZS6PW" for about six seconds, followed by six seconds of carrier. After TEP tests to the north conclude on November 1, 1987, the antenna is to be turned towards Australia for the Es season. (VK6 stations in particular should keep an ear open for this one as a possible Es distance especially late afternoon time!). Hal's telephone numbers are —
Office (012) 45 5566 and 45 5567 from 0800 to 1700 South African time
Home (012) 46 6544 or 46 4725.
ISD connections will be needed, of course. Hal's address is PO Box 27746, Sunnyside, South Africa, 0132.
2. Confirmation has now been received that the Cairns six-metre beacon is operational and this completes the first part of their project. Ian Baty, Secretary of the Queensland Tropical Region VHF Association, and who is VK4AFC, also comments if the Cairns and Townsville beacons remain on the same frequencies they may have to consider time-sharing.
3. Karl VK6XW, in Albany, has written to say the VK6RTW six-metre beacon has been off the air for a while but hopes it will be operating for the December period. Therefore, I have left the beacon listed and hope that it is back on the air by the time you read this epistle. The Albany two-metre beacon is still operating. See further comments from Karl's letter elsewhere.
4. Ian Stanley VK3CIS, has written because apparently no one else did (!), to say there is a beacon in Melbourne, VK3RCW, on 144.950, which transmits Morse at five and 10 words per minute using FM. This is probably a similar arrangement to VK2RCW. Thanks Ian, for writing. Also, a note has been received from Kathy Gluyas VK3XBA, Repeater Administrative Co-ordinator, which, in effect, reports that VK3RMV, at Hamilton is no longer operating.

   Apparently there are problems with the power bill for running the beacons and the advice received here dated 9/9 indicates the beacon is to be switched off. It will go on again, presumably, if those who want it are prepared to pay something towards its operation. So, VK3RMV on 52 MHz and 70 centimetres has been removed from the list.

NEWS FROM SOUTH AFRICA

The September 1987 issue of *VHF News* from South Africa has arrived on my desk, per favour of Hal Lund ZS6WB. (Hal and I have had an exchange of correspondence previously).

Amongst matters discussed in the *VHF News* is that relating to the six-metre beacon which I have already told you about. Other uses for this beacon are propagation tests between South Africa and Malta. The call is 9H1SIX on 50.085 MHz and running 10 watts to a five-element Yagi.

One of the problems the South Africans have, and I mentioned this when I last wrote about South Africa, is the difficulty of completing Es contacts due to the way their population is distributed; there are very few opportunities due to the way their population is distributed; there are very few opportunities for contacts at the prime Es distances. On two-metres recently, ZS4AAB, in Lime Acres (KG11) completed a 900 km contact with ZS6BPJ/6 at Klerksdorp on CW. Other distances have been 775 km and 580 km. ZS4AAB was reported heard in Bulawayo, a distance of 1050 km.

To activate little known areas, the amateurs go out portable. They are very keen on using Grid Squares and hence travel around to activate those without local amateurs on VHF. They even have a small pool of loan equipment which can be made available to operators without appropriate equipment if travelling to a rare location.

As I said following the beacon list, VK operators may have opportunities again to try working a ZS6 as the Cycle 22 slowly makes its way up the scale. I well remember hearing ZS6LN on 50 MHz one afternoon and trying to make it a cross-band contact from 10 metres, but without success as the big hill to the west of me at Forreston dropped the signals and I could not compete with stronger stations. With nothing in the way at Meningie even I might have a better chance this time!

ALBANY SPEAKS

I was pleased to receive a letter from Karl VK6XW, outlining the present status of Albany on the VHF scene. The 10-metre beacon on 28.266 MHz is up and running well with four watts to a vertical dipole. As reported earlier, two-metres is okay, but six-metre seems to be the main problem.

All the beacons run from Karl's QTH in the town of Albany on the slopes of Mount Clarence about 50 metres above sea level, with a clear run to the east. He said no one loves the job of Beacon Officer because no one wants to really live with them in your back yard! At the moment the only stations operating on six-metres are Bob VK6BE and Karl VK6XW. One of the problems they do have is that the incentive to get on six is prejudiced due to lack of openings on that band during the Es period. I have heard this comment on air before today. One does wonder, however, in the light of the generally accepted situation, how many of the Albany stations are well set up for six metre operation? Operation from Esperence seems to have been moderately successful but I accept it is about 500 km closer to the eastern area than Albany.

Karl is not active on two-metres as he is right in the firing line of Aub VK6XY and Wally VK6WG, when the band is open, and they virtually wipe him out. Also, the beacon generates quite a problem when it is operating from about 16 metres away!

Karl asks me if I packed up my 60 dB hill and took it with me to Meningie. I can assure him and everyone else, I was glad not to have to pack it as it had already caused enough problems in the past!

VHF DXING

Charlie VK3BRZ, has drawn my attention to a special article in *ham radio* magazine for July 1987, written by Joe W1JR (a world renowned VHFer) covering various aspects of VHF DXing. It certainly should be required reading if you can lay your hands on the article. As Charlie says, a lot of it is only relevant to the North American Continent, but there is still enough in it for us to read it through again.

Charlie writes "You may find W1JR's definition of a QSO interesting, as I did. He makes no mention of a signal report as being necessary in order to establish a confirmable two-way contact. This seems sensible to me as too often signal reports are meaningless either because of the DXers syndrome where everyone is 5x9 or because, as in the case of Es contacts, QSB makes a simple signal report deceptive. Exchanging grid square references might be a better idea. Okay, after several contacts you get to know the other station's grid square, but you learn his call sign too! VHFers are basically honest and anyone hoping to be sneaky soon gets found out! And in the end, it is just a hobby and claiming false contacts requires that you first fool yourself."

I consulted the article again and from it learned just how keen many amateurs are on the Maidenhead Locator System of Grid Squares and how the grid squares can be used for "activity days" or "night" I suppose! Charlie suggests it may be worth considering a once a month activities period using the grid squares to see if it generates more interest than seems to be around at present in many places. I certainly think it may be worth a try and hopefully some club will see the virtue of this and try and set the ball rolling. And if the Ross Hull Memorial Contest this year includes reference to

the grid squares in the scoring, then this could be a good place for it to be tried.

As a matter of interest, the ARRL VUCC Award requires 100 grids on 50 MHz and 144 MHz; 50 on 220 and 432 MHz; 25 on 902 and 1296 MHz; 10 on 2.3 GHz; and five on all the bands above 2.3 GHz. You might also note that there are 32400 grid squares covering the whole world! As many of these are in the oceans, it will be some time before anyone works them all I am sure!

For comparison purposes with what goes on in the Southern Hemisphere, you might be interested to know there is a full table of all North American VHF and above claimed DX records in *ham radio*. I am sure they will not mind if I refer to it especially if it creates some further interest in the VHF and above spectrum.

On 50 MHz, records have been omitted since the primary mode is often hard to distinguish. Also, long-path QSOs exceeding 12 433 miles (20 004 km) were reported during solar cycles 19 and 21. Omitting EME, the two longest distances on 144 MHz are TE between KP4EOR and LU5DJZ established on 12/2/78 on SSB over a distance of 6328 km (3933m); and by ducting KH6GRU and WA6JRA on 29/7/73 at 4161 km (2586m).

On 432 MHz the longest contact was via ducting with KD6R and KH6IAA/P on CW 28/7/80 at 4103 km (2550m); and tropo WB3CZG and WA5VJB SSB 29/11/86 at 2121 km (1318m).

On 1296 MHz ducting KH6HME and WB6NMT SSB 13/8/86 4068 km (2528m); tropo WB3CZG and KD5RO CW on 29/11/86 2070 km (1287m).

On 2304 MHz tropo KD5RO and W8YIO CW 29/11/86 1531 km (940m).

On 3456 MHz tropo WA5TNY/5 and WB5LUA/5 CW 19/10/86 464 km (288m).

On 5760 MHz tropo K5PJR and WA5CIW/5 CW/ SSB 22/11/86 459 km (285m).

On 10.368 GHz tropo WA4GHK/4 and WD4NGG FM 7/8/84 478 km (297m).

On 24.192 GHz LOS WA3RMX/7 and WB7UNU/ 7 SSB 23/8/86 186 km (115.5m).

On 47.040 GHz LOS WA3RMX/K7RUN and WB7UNU/W7TYR/W7ADV SSB 7/3/87 8.72 km (5.42m).

No report for 76 to 149 GHz.

On 474 GHz LOS K6MEP and WA6EJO Laser 9/6/79 24 km (15m).

A comment was made that ducting was suspected when the path was mostly over water. No efforts have been made to separate out ducting on overland paths, they are grouped under tropo.

VK stations now have some idea of what lies ahead of them if they want to make any challenges!

THE NEW SOLAR CYCLE

Very soon, I had intended saying a few words about the approach of Solar Cycle 22, which is fast approaching us. Bill Tynan W3XO in *QST The World above 50 MHz* has beaten me to it. Bill obviously has access to much more scientific information that I have so I see no reason why I should not pass on to you some of his thoughts.

"Those who were around for the peak of Solar Cycle 21 fondly recall the sometimes fantastic conditions it produced. For several years beginning in the fall (autumn in Australia. . .5LP) the months from October through April provided legendary six-metre openings. Many accomplished WAC. In the West and Midwest, Japanese and South Pacific stations boomed in. Much of the country had a crack at the South Africans and many South Americans fired up on the band. A few stations operated from Europe, some legally and some not. Among the legal one, ZB2BL Gibraltar, and EI2W, EI6AS and EI9D in Ireland were widely worked. Also, fairly active was Icelandic station TF3SG, later changing his call to TF3T. Occasionally, a station would appear that could be classified as rare DX, one such was 5B4AZ on Cyprus." (In Australia much good DX was also available but we were severely limited due to not having the use of the 50 MHz region of the band. But many countries were worked from the Pacific Islands, plus, of course, Japan, USA, Mexico, Alaska, the Caribbean area, plus India, Hong Kong, Indonesia, Brunei, etc, etc. . .5LP).

"It is too early to predict whether the new cycle will be as good to us as the last one, but even if it falls short, some F2 openings are certain to return to six-metres over the next few years. Yes, by almost everybody's estimate, it seems sure we have seen the bottom of the solar cycle and are on the way up the curve. The NOAA Space Environment Laboratory in Boulder, Colorado, estimates the minimum of the cycle, and hence the end of Cycle 21 and the birth of Cycle 22, took place in September 1986, so we are a year or more into it and climbing.

"NOAA states in their report of June 17, 1986, that the average time between minimum and maximum is about four years. At the time, they were predicting the minimum to be about February 1988 and were estimating the maximum of Cycle 22 would occur in mid-1991. However, since the minimum was most likely either June and September 1986, the maximum will occur probably sometime in 1990. But we should not have to wait until then for the six-metre DX to return. Scattered six-metre F2 openings began to appear in October 1978, only two years after the beginning of Cycle 21. Based on this reasoning, there is a chance we may encounter some six-metre F2 about a year from now.

"In addition to elevated F2 maximum usable frequencies (MUF), other propagation modes should come in for improvement. Some of these will affect the higher VHF bands in addition to 50 MHz. Transequatorial propagation (TEP) should begin to pick up for those closer to the Earth's magnetic equator. Recall that two-metre openings between the Caribbean and southern South America, as well as between southern Europe and southern Africa, and Japan and Australia, were quite common during the early evening hours a few years ago. It has been shown that frequencies as high as 432 MHz can be propagated by this mode, although a two-way contact is yet to take place on this band. When it does, it will represent a new terrestrial world DX record.

"The more immediate affect should be an improvement in the 10 metre band. The return of better 10 metre F2 propagation should also give six-metre operators a chance to get together on the established liaison frequencies, 28.885 and 28.385 MHz.

"The bottom line — better conditions are coming, and quite soon."

Thanks Bill for some interesting facts. This should suffice for the moment to satisfy those few who have written to me asking for an outline on what we can expect with improvement in conditions for Cycle 22. Another factor not mentioned is the tendency for F2 propagation to follow the sun, ie contacts with stations in the Pacific Ocean regions are more likely to take place in the mornings, Australian time, than later in the day. Many contacts were made to the USA and Mexico etc around 0000 UTC perhaps even earlier or maybe later, such are the vagaries of the system. Certainly, as the good conditions approach, you will be missing out on some good contacts if you lie in bed too late. But none of this can be taken too literally. Many contacts have been made during the afternoon, so it is really a case of being vigilant and calling and listening on the band as well as monitoring 10-metres if you really want those exotic contacts.

Please remember not to clutter the calling frequency of 52.050 which is now widely known throughout the world. The North American DX calling frequency is 50.110 and their national calling frequency is 50.200 MHz. But, keep in mind that we in VK have some restrictions on the use of 50 MHz, but what we have been granted so far will at least allow us to have access to a lot of areas which do not normally bother to look on 52 MHz. One major problem for overseas stations is that those with antennas designed mainly for 50 MHz often do not work too well on 52 MHz as efficiency usually drops off very rapidly on the high frequency side of the optimum frequency. That is why so many of our antennas cut for 52 MHz will work quite well at 50.110 MHz because of the slower drop off in efficiency on the low side. As long as you do not become too paranoid about a rise in the VSWR as you go down in frequency you will find you can listen quite well down there with not a great deal of loss in power. After all, 50 watts from your 100 watt amplifier will not really make a very great difference to what is heard at the other end unless perhaps you are working very marginal DX on CW!

Finally, it was good to read in Bill Tynan's notes that the North American boys had a ball this year on Es on both six and two metres. July 21 was a great day for VE1YX who worked 160 stations in Europe, working six call areas in G-land, plus EI and LA and cross-band six to 10 metres to F, DJ, HB and PA. Norwegian stations now have full use of 50 to 52 MHz with some power restrictions. Apparently, the French are getting a little snarly about how things are going on six-metres and have begun allocating subscription television to several stations right in the 50 MHz band. If these stations run high power they will put plenty of crud on the band and make it difficult for the G stations, whom the French have not been happy about having 50 MHz anyway!

Bill also said two-metres had been as wild as its 50 MHz cousin! VP5D worked 31 stations in the US. July 17, was a great two-metre Es day with WB9MSV having more that two dozen contacts over a four hour period while KD7IY had 62 contacts in two and a half hours. KH6HME has worked US State number 3 by working ND7M for a distance of 2528 miles (4068 km).

OTHER NEWS

A call from John VK4ZJB, says Nev VK4ZNC, is having another fling at a DXpedition this summer and hopes to operate from T2 Tuvalu, T32 Tarawa and C21 Nauru. I hope these locations are correct but that is the best I can get from the Call Book. In any case, it seems Nev will be going nearer the equator this time so should find it quite humid in December. Frequency will be 52.050 MHz. All operators are asked to be gentlemanly in their approach to contacts with Nev. If you have already worked him at a particular prefix then give others less fortunate a chance to contact him, or at least make your contact very brief.

John also said, with the change to stereo, there have been changes to the operating frequencies of Channel 0 — they are now 51.9140625 and 51.671875; the station will also be moving to Mount Mowbullan near Toowoomba, which is about 160 km west of Brisbane, this will provide some relief for six-metre operators in Brisbane, if only with the removal of some of the crud especially with one of the stereo frequencies so close to 52 MHz. Channel 10 will now operate from Brisbane which should cause less problems although there will be a need to keep your fourth harmonic level low or you may still cause some interference.

STOP PRESS:

Latest news from John VK4ZJB, is that Neville VK4ZNC, was to leave Brisbane on November 13, 1987, and anticipated spending 10 days at Nauru (C21), 10 days at Tarawa (T32)), and 10 days at Tuvalu (T2). There is also a possibility that the tour could be extended until about Christmas time.

Steve VK4KHQ, who has been running a keyer on 52.060 MHz, advises in a phone call he has changed jobs and this will keep him away from home during most weeks so the keyer will be largely off Monday to Friday, and with limited operation at weekends. This will probably mean some reduction in contacts to the Mount Isa area.

RADIO NAVIGATION SYSTEMS

I was interested to read in *The Western Australian VHF Group Bulletin* for September, of a new

navigation system being developed. I believe it is of interest to readers.

"Most readers will remember reading about the Syledis positioning system which operates in the 70 centimetre band and caused much concern during the America's Cup races. Syledis is still being used extensively for off-shore survey work where reliable and accurate position fixes are required.

"Some relief from UHF interference to our 70 centimetre band may be on the way with a new system called "SPOT" from Off-shore Navigation Inc, of New Orleans. This system operates in the medium frequency band between 1.600 and 1.800 MHz and is unique in being able to differentiate between the sky wave and the ground wave signals received by the mobile receiver. SPOT achieves this by the use of Pseudo-Random Code (PRC) modulation. The PRC code for a particular base station is stored in the microprocessor memory of the mobile receiver. During acquisition, the mobile receiver looks for a signal with the desired PRC, and the phase of the signal driving the code generator is constantly shifting until it agrees with the received PRC. When this occurs, a high correlation peak is generated indicating signal acquisition and code lock-on. Motion toward or away from the station can then be measured by observing the phase of the internal signal driving the mobile code generator. When the sky-wave arrives, a second and possibly larger correlation peak will be generated, but it is readily distinguished from any ground wave peak as long as any ground wave exists.

"The range of the system is limited only by the presence of a ground wave signal. Tests in the Gulf of Mexico have demonstrated stable ground wave coverage out to 400 miles (660 km).

"Another feature is that SPOT utilises spread spectrum transmission. SPOT actually transmits on 4000 discrete frequencies separated by 38 Hz in an overall bandwidth of 152 kHz (99 percent of transmitted power). A one watt transmission is therefore divided so that only 0.00025 watts will be transmitted on any given frequency.

"High accuracy relies on accurate time references at the transmitter and receiver. Each SPOT mobile and base station incorporates a cesium beam frequency standard, enabling one-way range measurements to be made. In the normal mode, only the base stations transmit. Every three to four hours the mobile station will initiate a round-trip transmission to eliminate any clock drift between the two cesium frequency standards that may have occurred since the last update. Relative drift will be well under one metre in this period."

Figures 1 and 2 give a visual outline of the operation of the SPOT System. (Drawings reproduced courtesy of *The West Australian VHF Group Bulletin).*

The South East Radio Group Bulletin reports an incident which occurred on 30/8 when the Novice Class had finished for the night and the students, with their "portable" room heaters tucked under their arms headed for the door and home. Ivan VK5QV, stayed behind to tidy up and close the building.

Before leaving, Ivan had the students return and shuffled sheepishly back into the room followed by a brace of armed gendarmes. They (the students) had been apprehended loading certain electrical appliances suspected of being stolen, into their vehicles!

Ivan was able to verify that they were, in fact, students and really did not look like criminals (not all of them, anyway!) and after some amateur radio PR, everyone went their way, free men.

At least this indicates the gendarmes are vigilant and it was probably worth making sure, especially when one considers the quantity of amateur equipment being stolen.

THE BEACONS

There are still many custodians who need to confirm the status of their beacons following my now repeated requests through these columns. Apart from the Albany note this month, and the extraction of information regarding a frequency change for the Busselton beacons, nothing has been heard from anyone in Western Australia. Canberra also is noticeably lacking in attendance to this matter as are the Tasmanians.

THE NEW LOCATION

Having settled in rather well at Meningie (housewise, that is!), I hope soon to be able to do something about getting some antennas in the air. I have completed all the shelving for the equipment in the shack and suffered hours of fumes from the heavy-duty wood finish they have been given. Every time I shut the room up and re-open it the next day the fumes are still there, but I suppose they do eventually dissipate!

I have been consulting with David VK3AUU, on possible antenna changes and, as it takes some time to build new ones, I may, for this year, content myself with using some of the former antennas. I really did not think anyone could be so busy after making a house change, there never seems a spare moment to get on with the amateur radio side of things!

I wish to thank everyone for being patient at the general absence of specific news items during the interim period, Once I get operational again I hope to exploit my better location and be able to tell you more about general band activities.

With this issue I commence my 19th year of writing these columns. Once again, I wish to thank all those good people who, over the years, have continued to provide me with so much valuable information. There have been changes of personnel writing in that time of course, but news from new sources is always of interest. I also want to thank those connected with *Amateur Radio* magazine for the continuing support they have given me. I don't normally single people out but I have found a very close affinity with Ken and Bett McLachlan and enjoyed so much the little notes penned by them from time to time. We are all going to miss their expertise associated with the production of the magazine, one which I have always found well worth reading.

BICENTENNIAL ANTARCTIC EXPEDITION 1987-1988

Don Richards VK2BXM, has written to say they are planning another voyage south in the *Dick Smith Explorer* vessel, leaving early December and sailing directly to the Antarctic where the shore party will be put ashore at Cape Hallett or Cape Adare, about 70 km from Mount Minto. In the event of bad weather, a helicopter can be used to transport the climbing party to the shore. The ship will then put to sea and continue a marine studies program.

Mount Minto is the highest point in the Admiralty Range, being 4163 metres ASL and has never been ascended though several attempts have been made and failed due to the poor weather. Two challenges exist, the first to cover the 70 km to the Mount and secondly, to climb it!

Don Richards is ship's master and radio operator and sailed as mate and radio operator to Commonwealth Bay in 1981/82, and was master and radio operator of the DSE in the *Project Blizzard* expedition of 1984/85. He will be taking HF equipment and will not be leaving the ship, nor will a shore station be set up. The climbers will carry the equipment necessary to keep in contact with the ship.

Don is hopeful that Kenwood will loan him one of their transceivers that carries six-metres SSB and FM. One problem is the rigging on the ship will largely preclude the use of a six-metre beam. He also says he could take two-metres again and try for auroral scatter.

So that is some preliminary information on a possible six-metre contact. Don has indicated he will be sending me additional information, so by next issue there may be more to tell. In the meantime, you have been warned!

CLOSURE

May I take this opportunity of wishing everyone the compliments of the season and may Christmas and the New Year be a very happy time for all. Transceivers are now too expensive to include in Christmas stockings but you may receive something you value equally — say a loving kiss and a hug from your spouse!

Closing with two thoughts for the month: *One of the greatest sources of energy is pride in what you are doing,* and *The measure of life is not its duration but its donation.* 73 from *The Voice by the Lake.*

ar

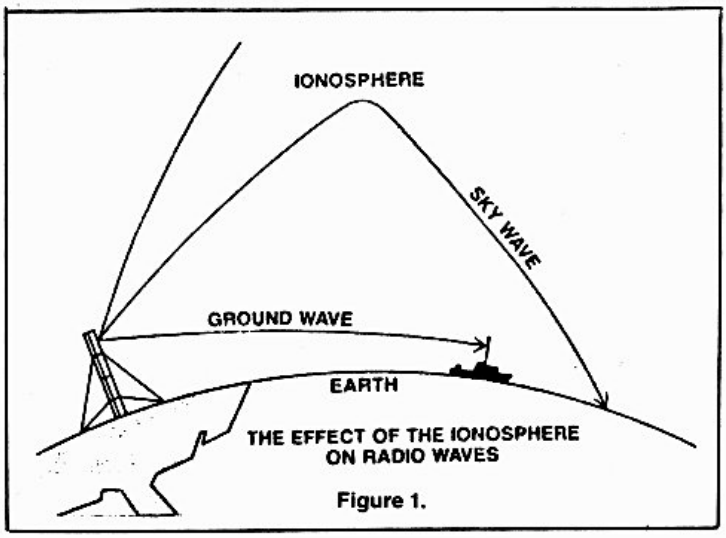


Figure 1.

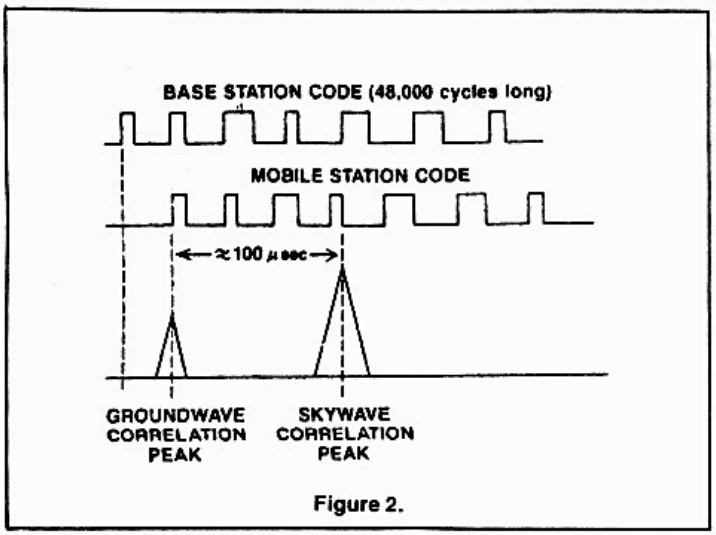


Figure 2.

Beacons & Repeaters

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

The Federal Technical Advisory Committee (FTAC), maintains a national database of Australian Beacons and Repeaters. Access to this information is now also available on the Federal *Telememo* bulletin board. To keep the information up-to-date it is important that State technical committees, as well as the various groups, advise the Federal Office of any changes or additions. Send this information via *Telememo* or write to FTAC, PO Box 300, Caulfield South, Vic. 3162.

Work is proceeding on the various papers concerning beacons, repeater tone access and pagers for neighbours. Your input to the various discussions is most welcome.

During JOTA week in October, Australia's satellite organisation *AUSSAT* made available an audio channel via one of the transponders. This enabled a week-long hook-up to be made between VK6RTH 6800, in Perth, and VK2RMB 6875, in Sydney. It provided a most interesting experiment in long-distance linking.

Pager systems are still expanding their national overage and it is unfortunate that their allocation is adjacent to the top end of the two-metre band. Several groups are having to come to terms with them and this is the reason for the investigation into 'pagers for neighbours'. In VK2, it was recently announced that Telecom installations would be made adjacent to the sites used by VK2RHR 7350 Mittagong and VK2RGN 7325 Goulburn. This problem is currently being addressed which could require the assignment of alternative channels to these repeaters. Not an easy task in that part of VK2 where almost every channel is used and accessible from the higher ground of the region. The Sydney Eastern Suburb System VK2ROT 7075 suffers from remotely generated intermodulation on its input. This system is expected to change to channel 7025. In the south-west region of Sydney VK2RLD which was on 7375, developed a pager for a neighbour and channel changed to 6625. This channel had been VK2RPI of RTTY in Newcastle, but had not been activated as Newcastle also has a RTTY repeater on RAN 6975. Pagers have not left Newcastle alone either and VK2RTZ 7100 has channel changed to 6775 and 7100 will be relocated to Muswellbrook as VK2RZL, a new system. Parkes and District ARC have had their VK2RWM 7100 off air for much of the year as a result of a lightning strike. They are currently building a UHF repeater to add to the site.

On the Beacon side of things, a six-metre unit is currently under construction for installation at Broken Hill. It will be VK2RBH and the channel should be 52.320 MHz. This is currently utilised by VK6RTT, so we will see if they are able to change to one of the VK6 allocations. The Queensland Tropical Region VHF Association are to establish a 10-metre beacon on 28.265 MHz. They are also constructing a 2304 MHz beacon. All Australian 10 metre beacons will have to change to a time slot, shared channel system from 1990. There has been some interest recently in the possible establishment of a 20 metre beacon in eastern Australia. This is unlikely as the 20 metre project is managed from America and the only slot available was planned for a possible system on the western side of Australia.

ar

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General
C Constructional
P Practical without detailed constructional information
T Theoretical
N Of particular interest to the novice
X Computer program.

QST July 1987 — Low Cost QRP Power Booster (C N). Simple Crystal Filters (P N). Vertical Antennas (G).

HAM RADIO June 1987 — Compact 20 metre Transceiver (C). Diode Leakage in Double Balanced Mixers (P N).

RADIO COMMUNICATION September 1987 — Antenna Construction (P). 1.8 MHz QRP Transceiver (C).

SHORT WAVE MAGAZINE June 1987 — Product reviews and general information for the shortwave listener.

ELECTRONICS AUSTRALIA September 1987 — Australia Rewards Hi-Tech Enterprise (G).

CQ August 1987 — Antenna Special (G N).

Break In August 1987 — ATV Special Issue. (G).

ar

Ionospheric Summary

The August summary from IPS Radio and Space Services contains the following information.

The monthly averages are 10 cm flux 90.3; sunspot number 38.6; A Index 13.5; I Index 27.2; and there were nine flares.

Solar activity in August was low except during the periods August 7 to 8, 13 and 22 to 23, when a number of weak M class flares appeared. The total of nine M class flares during the month is the largest number observed for any month since February 1986.

The activity arose from a number of solar regions, and there were regions visible for the whole of the month on the solar disc each day. The number of regions produced a high value for the month averaged solar flux of 90.3, the highest value since June 1984, and also a high value of 38.6 for the monthly averaged sunspot number. The yearly averaged sunspot number for February rose again strongly due to the higher sunspot number experienced over the last few months.

With regard to geomagnetic activity, August was a disturbed month with two strong disturbances and several other periods of lesser disturbance. The most disturbed period was between August 25 and 27, when there were two days on which the A index exceeded a value of 30.

The field was active on August 5, 12 to 16, 24 to 27, 30 and 31. There was a sudden commencement, an abrupt change in the strength of the field at 0941 UTC on August 24, and a major storm started at 0700 UTC on August 25, and remained that way until it abated on August 27.

When the new cycle begins, there are many and varied assessments from different sources of what the cycle number will peak.

VK2QL has received a document called *The Solar Update for Cycle 22*, from the US.

At present, IPS have not changed their initial assessment that the cycle will peak around 130.

There are already 31 reported predictions for cycle 22 smoothed sunspot number.

Those listed in the update are 107, 118, 120, 159, 170 and 185. All claim the maximum will be in 1990 or 1991. One of the predictions give the peak of the cycle to cover 1990 to mid-1991, instead of the usual short peak.

In their summary, IPS show the curve of cycle 21, which started in June 1976, peaking December 1979, and bottoms September 1986. The cycle ranks as the second highest ever recorded, the highest being cycle 19.

The summary has a graph showing the 12 month smoothed and one month average, and the peak monthly sunspot number towards the end of 1979 was 188, which was not far off the peak sunspot number of 201 for cycle 19.

—Contributed by VK2QL

VNG — SILENT KEY

On October 1, 1987, Australia's precise time and radio frequency service, VNG, ceased operation.

VNG had operated for 25 years and was used by astronomers, sailors, the scientific community, surveyors, the military, government departments and radio amateurs.

The closure meant the removal of a cheap and readily accessible time and frequency standard which was widely used throughout the Australasian-Pacific basin region.

The service gave the precise time through a series of tones and voice announcements, and could be used to determine geographic locations.

A Telecom spokesman said VNG cost $100 000 a year to operate and attempts during the past year to have it taken over by a government department were unsuccessful. It was consequently thought, in the circumstances, no longer appropriate to keep the service running.

VNG operated on a number of frequencies from Lyndhurst, south-east of Melbourne. Telecom last year said it had to vacate the Lyndhurst site and relocation of VNG could have cost about $1 million.

During the past year major government users of VNG were asked if they wanted to provide funds for the services on a user-pays system.

It said other systems were available to check time and frequency, and satellite technology, whilst more expensive, was now being used to determine geographic locations.

—Contributed by Jim Linton VK3PC

How's DX?

Special Guest Writer:
John Saunders VK2DEJ
8 Toni Crescent, Ryde, NSW. 2112

DX OPERATING

Whilst talking to a couple of friends who have recently obtained full calls, it became obvious that they were not aware of come of the established methods for, not only working that rare one, but also obtaining that elusive QSL card.

For the beginner in DX chasing I would recommend joining one of the established DX nets. This provides the opportunity for working DX even if you are only running barefoot (no linear amplifier) into a dipole. A net control station will come on air at a given time and frequency, eg ANZA (Australia, New Zealand, Africa) at 0500 UTC on 14.135 MHz and ask if there are any stations who wish to join the net. This results in a number of stations all calling in at once. The control station lists them, often in order such as Australia, Africa, etc. Then, when he has his list, he will start at the top and ask each station in form if they wish to work any of the stations listed. It may happen that you need a ZS3, and one has checked into the net. When you heard him check in you noted his report, say 5 and 7. When your turn comes you simply call:

"ZS3 this is VK-GAA, your report is 5 and 7,"

He will reply:

"VK-GAA, this is ZS3AA — thank you for the 5 and 7,"

You then confirm your report saying:

"Thank you for the 5 and 6 ZS3AA, this is VK-GAA, back to net control."

You have exchanged reports and that is the basic minimum needed for a contact.

Now that you have had a contact comes the hard part — the QSL!

In most cases use the QSL bureau. It may take time but it is cheap. If ZS3AA says that his QSL manager is WA3HUP, then you must send your card direct to that station and enclose in it a self-addressed envelope and return postage. Obviously, Australian stamps are no use so you pay a visit to your local post office and buy some International Reply Coupons (IRCs). At the time of writing this they are just under $1.00 each. Send a minimum of two and preferably three, which will enable the QSL manager to cash them at his post office to cover air mail postage for your card. Do not delay the net by asking for QSL information, etc. The net controller should mention it from time to time.

QSL managers donate their time and effort and deserve all the help you can give them. Do not expect them to pay out of their pocket for your card. Also, the addressed envelope makes things easy for them and they will return your card to you with the minimum delay. Do not expect it too soon, however, the station you worked has to send his copy of his log to the manager so that your contact can be verified. If he does this by radio it is fairly prompt, but if he sends it by mail then, some time may transpire between your contact and the manager receiving the log. Very few QSL managers will acknowledge cards sent to them via the bureau. If ZS3AA is only visiting the country, he may wait until he returns home before processing the cards so please be patient. Do not send multiple cards or irate letters.

Imagine if ZS3AA had 5000 contacts, when he eventually gets home he will certainly have a lot of mail to answer. It would cost him a fortune, on top of his air fares, etc so do not expect him to pay further. In some cases a DXpedition to a remote location will suggest that offers of financial help would be appreciated. This is fair and reasonable as it can cost thousands of dollars in some cases to get to rare sites such as Kerguelen Island. However, avoid those who demand X dollars for a QSL card. It is amateur radio and not a commercial operation.

Some people are against the use of DX nets, but I feel they have a place. First, they help the new operator and avoid the "dog-piles" (unruly calling masses!) that occur. Secondly, sometimes the DX station is not an experienced operator and he appreciates the help of a DX net control in handling the crowds.

On other occasions, an experienced operator will operate on his own. Often he will work simplex. That is, he will transmit and receive on the one frequency. This is fine if there is no great rush on him, but if a lot of stations are looking for him then he will operate split frequency. That is, he will call say on 14.195 MHz and say "This is YA7AA listening between 14.205 and 14.250". You then pick a frequency in his specified range and call him. If you are quick and listen for him for a time you may detect a pattern. He may start answering stations on 14.205 and then work slowly up to 14.250 then flip back or tune back slowly to 14.205 MHz. One of the worst cases can be if the DX station says he will listen on 14.205, 14.215 and 14.225. This causes three dog-piles and makes it difficult to have a contact if you are not using five kilowatts and a 10 element beam at 100 metres!

It pays to listen for a while and work out how he is working the crowd. Once you have a contact, make it short and snappy.

He knows his call sign quite well, do not repeat it or drag it out phonetically. He needs to know your call. Say it slowly and distinctly with phonetics. He is not interested in your name, your town, your equipment or your weather. Do not hold everyone up by asking his QSL information. He should announce it from time to time. The various magazines often print them and, if you are a real DXer, you will subscribe to one of the regular DX bulletins which publish all this information, plus details of anticipated events.

Advice is often given that the best way to work DX is to listen, listen and listen. This is good advice but by all means throw in a call now and then. I once called CQ Africa at 3 am local one morning and a 5R8 replied to my CQ. Directional CQs, such as above are handy if you are chasing one area or for example you can call CQ Nevada, or whatever.

It is also worthwhile to throw in a CQ on the empty band occasionally. You never know who may be listening. I have made a practice after a contact to listen on the frequency for a while. Provided the previous contact was not there first, then it is considered your frequency. Quite often anything up to a minute after your contact has ended a station, often low powered, will call. Sometimes you can land quite a rare one and, if during your contact you have been saying that you need a 5H3 contact above all else in this world, then for goodness sake listen on for a while as one may well appear, or someone else will call to let you know there is a 5H3 just up the band.

DXing is a 24 hour operation. After all, if you want South African contacts then it is no good calling if it is 1 am over there. You need to be aware of world times and even think in terms of UTC. All log book and QSL entries should be in UTC.

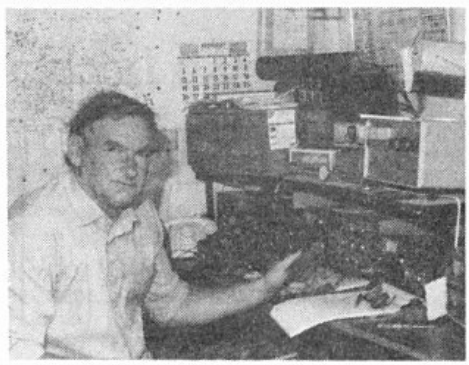
When you get that beam up then you start learning short paths and long paths at various times of the day, particularly on 10, 15 and 20 metres. I have often felt that *DXing is like fishing.* After a couple of days off air you come on air and everyone says "you should have been here yesterday — there were ZAs, etc 5 and 9."

On occasions you will hear someone say to a DX station "I'll send my card and a green stamp." You may well wonder what form of green stamp is being collected. A green stamp is a US dollar note that is often included in place of IRCs to cover the return postage.

You can obtain dollar notes from your bank or by from US tourists. Sending cash by mail is frowned on by many postal authorities so the IRC is the correct way to go. In some countries the recipient could get into great trouble if he were found out so you should take care if you indulge in this practice. Once, years ago, I heard of Australian dollars referred to as brown stamps.

Some countries do not recognise IRCs, so you have a problem trying to observe the conventions on postage. One way to show you mean well is to get a small parcel of Australian mint stamps up to a dollar — a recent philatelic release for example — and enclose that with your best wishes. This will often ensure a speedy return QSL.

Another technique that seems to help is to enclose a photograph of yourself and station. I finally had my photograph printed on the back of my QSL card. Every little bit seems to help. With Russian stations often being club stations, it helps to place the name of the operator you worked on the card — it apparently helps them sort out who was operating at the time. I usually put the operator's name on anyway as it shows you heard something through the QRM.



Sometimes, sending a photograph of yourself and the shack helps with the return of a QSL.

Sometimes it can take a year or two for your much-wanted card to appear. The postage system between Box 88 in Moscow and some of their outlying countries, such as UM8, etc seem to be very slow.

Remember that the final courtesy of a contact is a QSL card. If the other person has boxes full he may not be interested. If, maybe for some reason he does not care to QSL, then it's no bother. Often a card is wanted for an award or some purpose, so if you do not QSL, for goodness sake do not say "100 percent QSL here". Australian stations do not have a high reputation in this field and I think we should make it clear as to our intentions during a contact.

A few conventions worth remembering are:

a) No one owns a frequency.

b) Always ask if the frequency is in use — preferably twice before your first short CQ.

PERSONAL PER HATES

a) The DX station that gladly accepts your return postage and then returns to you via the bureau.

b) The operator who never QSL but say "100 percent QSL here."

c) The operator who can't wait for the end of the contact, but must break in to an established QSO. Reasonable in an emergency, but — just to tell me how hot it is today! ? !

d) The person who fires 5 and 9 and then needs three repeats to get your handle (name) and call sign.

e) The DX station that has 5 and 9 printed on their cards.

f) The operator who calls CQ for 10 minutes, often without announcing the call sign.

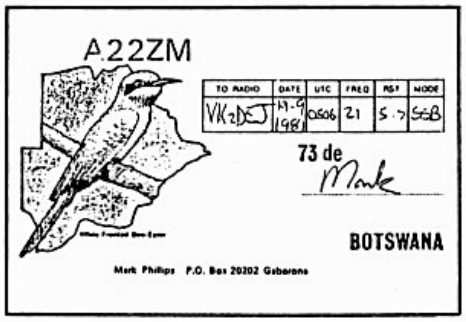
g) The character who calls "CQ longpath."
h) The person who says QRZ when they mean CQ.

And so it could go on but, all in all, it is a lot of fun. I hope you catch a few rare ones in the near future.

DX WORKED contributed by Steve Pall VK2PS

Aug 30, 1987:
Tom JW5E on SSB 14 MHz. QSL manager LA5NM.
Sep 6, 1987:
John BY4AOM on SSB 14 MHz from Shanghai. QSL to PO Box 227, Shanghai.
John is aged 68 and speaks excellent English as his mother was an English lady.
Sep 12, 1987:
Paul T32BE on CW 3.5 MHz. QSL via WC5P.
Sep 13, 1987:
Nick ZC4EE on CW 14 MHz from Nicosia. QSL via the bureau.
Sep 19, 1987:
CR6BWW a Special Call Sign for the 60th anniversary operating on SSB 14 MHz. QSL to CT4BWW.

ar



ODE TO AN EARLY BIRD

Now you early birds take great delight
At getting up at dawn's first light
To practice Morse — your keys a-tapping —
Well — I guess it makes a change from yapping.

Then again soon after tea
Once more your hands are on the key
Or — maybe now you're trying to read
Dots and dashes sent at speed
Trying not to miss a letter
Always striving to do better.
And it's funny how you never tires
Of changing all your poles and wires
Hoping that maybe you'll hear
Strange voices from the atmosphere.
Voices from lands far away,
My word! Wouldn't that just make your day.
All this sometimes causes strife
with your dear long-suffering wife
Who while your hands and tongues are wagging
Tries hard not to be a-nagging
For she knows you do enjoy
Playing with this noisy toy.

Well early birds I takes delight
In wishing you a Christmas bright
And may you all both far and near
Have a dot and dashing great New Year.

Joan Coles, wife of VK3DEG

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

It seems to me that I was only recently wishing readers a Merry Christmas, and here it is again! Time sure flies when you're having fun (?).

So, all the best for Christmas and the New Bicentennial Year to all who read this column, and, come to think of it, to those who don't. Let us make a bicentennial effort in 1988 to end in reports on those intruder stations you don't wish to hear using the amateur bands, who, after all, have their own frequency allocations.

IW statistics for August 1987: 108 AM stations reported; 178 CW stations; 49 RTTY stations; 74 intruders using other modes, and 35 supplied their call signs. Good help was received from VK2s BRC, DEJ; VK3s AMD, XB; VK4s AKX, BG, BHJ, BTW, DA, KHZ; VK5s GZ, TL; VK6RO; VK7RH; VK8s HA and JF.

The *big nuisance frequency* for August was 14.076 MHz, with many intruders reported by Norman VK4BHJ, mostly using tactical call signs. The *woodpecker* was busy on 7, 14 and 21 MHz.

As mentioned in the November AR column, I intend to talk a little about the various modes used on the air for the information of those who are not sure, or are perhaps new to the hobby. Last month we dealt with A1A mode, which is CW. This month we talk about radioteletype, or RTTY, which is one of the most widely-used modes employed by intruders, and one of the most difficult to identify, if one does not have RTTY capabilities in the shack.

You can establish if it is an intruder you are hearing by using the following method:

RTTY uses two frequencies — the mark and the space. Wind your VFO up to the high side of the signal and zero-beat it. Then very slowly wind down through the signal and you will hear the signal on the second frequency start to creep in. The difference between the two is the 'shift' of the transmission, and the point midway between the two is the transmitting frequency. Amateur operators are permitted shifts of up to 850 Hz, so if you measure a shift greater than that, then you are hearing an intruder.

RTTY signals are **not** intruders on the 80 metre band, as this band is share; RTTY signals are intruders anywhere on the amateur segment of the 40 metre band; RTTY signals are only intruders on the 20 metre amateur band in the segment 14.000 to 14.250 MHz, as the segment 14.250 to 14.350 is shared; RTTY signals are intruder on any segment of the amateur 15 metre band and similarly are intruders on any segment of the amateur 10 metre band. We are, I stress, talking about ***non-amateur RTTY.***

So that will get you started on reporting Non-Amateur RTTY stations using our bands, and we will see you next month. 73.

Bill VK2COP

ar

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateurs Old Timers' Club

The Victorian Branch of the Radio Amateur Old Timers' Club held its Annual Luncheon and Get-together on Wednesday, September 23, at the City and Overseas Club. This was very well attended with 68 members present. Our President, Bill Gronow VK3WG, was Master of Ceremonies and he welcomed all members and guests.

After the first course of the luncheon, the Royal Toast was proposed and members responded. During the luncheon, members had ample opportunity to meet old and new friends and to converse in a very convivial atmosphere. At the conclusion of the lunch, the President of the RAOTC commented on his report.

Firstly, reference was made to the passing of our old friend, Max Hull VK3ZS, and Bill took the opportunity of saying that Max's contribution to the organisation and development of the RAOTC will long be remembered — there was never a more willing and efficient worker. Everything he undertook, he did with dignity and style. He was a foundation member of the RAOTC (his membership number was 8), and he joined on February 16, 1976. Max's licence number was No 2307, dated 17/4/1939 and he was variously Committee Member, President, Editor of the OTN Journal and the MC at dinners and luncheons. He was one of the original, originating members and we are undoubtedly going to miss him very much indeed.

The President reported that the new members for the year totalled 33 and plans were in hand, by the Committee to recruit new members to maintain our numbers and increase them in the future.

All members were asked to bring the RAOTC to the notice of amateurs who they contact on the air. New club members are always welcome and membership is accorded to radio amateurs who have been qualified to hold an amateur licence for 25 years. Readers who would like to join as asked to send a stamped and addressed envelope to Harold Hepburn, 4 Elizabeth Street, East Brighton, Vic. 3187, for an application form.

The next OTN Journal will be issued about February 1988, and the Editor, Kevin Duff VK3CV, has some material in hand. However, if members have any interesting stories, anecdotes, cartoons, jokes, etc, that may be used in the Journal, he would be very pleased to see them. The address is 10 Stanley Grove, Canterbury, Vic. 3126, or telephone (03) 882 6431.

The Committee remains unchanged and the President took care to thank all members and everyone who had arranged the luncheon.

Our Secretary/Treasurer, Harold Hepburn was complimented for his efforts and our President said that Harold's assistance during the period of his office has been greatly appreciated.

John Tutton VK3ZC, was asked to make some comments about the RAOTC QSO Parties and John stressed the need for everyone to take an interest in this Club activity. Anyone requiring further details, and the rules, are advised to contact John.

Lay Cranch VK3CF was asked to speak and he introduced his guests, Ken Gott VK3AJU and Ric Hill VK3RC. Both of these gentlemen were very welcome and we trust that they enjoyed themselves.

The Wireless Institute is assembling a collection of QSL cards and Ken Matchett VK3TL, is looking after this. Ken spoke about this collection and stressed the importance of retaining and preserving QSL cards, particularly early A and OA cards. These are likely to be of considerable value to the WIA collection in the future. Ken would be very pleased to receive any QSL cards and they can be forwarded to him at his address, PO Box 1, Seville, Vic. 3139.

When the luncheon concluded, Chris Long, who is a freelance museum and archives researcher, showed some extremely interesting films. One of these films dated back to 1912, and Chris spoke about the advent of sound film or "talkies". Chris described this era very well and a transcript of his talk follows:

"All of my previous visits to RAOTC luncheons were at the invitation of the late Max Hull VK3ZS, and to some extent this talk also has grown out of one of Max's suggestions. About 12 weeks ago, I was having coffee with Max in his shop in Canterbury. We were talking about technical subjects and history and the subject of early talking pictures came up.

"About 10 years ago I had scripted a documentary on the beginnings of sound film in Australia. I interviewed quite a few RAOTC members for that series, Jack Murray VK3AJY, Arthur Forecast VK3AM and many others, and it struck me that there was a rather strong connection between the radio and film industries. That connection was cemented by the introduction of sound to the film after 1929, when radio techniques were suddenly necessary in an area which had previously only involved optics, mechanics and chemistry.

"The films which I have to show you today are among those which turned up 10 years ago in the course of my searches for program material for the ABC. Peter Wolfenden VK3KAU, worked closely with me on the project and I often used his old Pathe projector to screen through the old nitrate films which we located.

"The first of these films is one which some of you may have seen over ATV, but which hardly any of you will have seen projected on a screen. Peter Wolfenden and I had been searching for early footage of radio stations for some time, when the WIA's Federal President, David Wardlaw, mentioned that he had some old films at his home which originally belonged to his father. The films were of a very odd gauge — 28 mm in width — a home movie gauge introduced by the French Pathe Company in 1912, but only moderately successful. Fortunately, David had an old Pathe hand-cranked projector to try the films on and we were amazed to find that one of these was a documentary film on radio, obviously French and probably produced before 1913. When I checked through film lists of the British Film Institute and the Australian National Film Archive, I was amazed to discover that we had probably located one of the oldest radio documentaries surviving anywhere in the world. The film had originally formed a part of a home film library run by Herschells in the 1920s, a library situated in the Flinders Street Station buildings, about where Hearnes Hobbies, in Melbourne, is now.

"Now the final problem was to get a 16 mm film print made from the 28 mm original. Fortunately, Peter Lord, of Victorian Film Laboratories, was a novice operator and a member of the WIA, so we had a friend in the business to do the printing for us. Peter managed to find an old 28 mm projector movement which he fitted to a 16 mm printer especially for this job and here is the result.

"The next film is of particular importance in the history of sound film. In the early 1920s, Doctor Lee De Forest turned his inventive talents towards the perfection of a system of producing talking pictures. By using an electrically modulated glow tube in the camera, he was able to photograph the sound track down the side of the picture image onto the film itself. In other words, De Forest perfected the 'variable density' recording system back in 1922, and immediately set about producing short demonstration sound films in New York to demonstrate the system's possibilities.

"This De Forest Phono-Film system, as it was known, was introduced to Britain by an expatriate Australian radio engineer named Cyril Elwell. Late in 1924, Elwell set up a small sound film studio at Clapham Junction, in London, producing a series of demonstration sound films there for about four years. From 1924 to 1928, the tiny Clapham studio was the only sound-equipped film studio in England, and most of their films were short recordings of stage artists like Edith Sitwell, Sybil Thorndike and George Robey.

"The films usually lasted about 10 minutes or so, and were intended principally as an advertisement for the sound system. They were basically experimental films, and only a few city theatres were wired to show them in the silent film days.

"Late in 1926, De Forest Phono-Films, at Clapham, produced a few more ambitious dramatic talkies including the effort you are about to see.

"Now you have to remember that talking pictures were completely unproven in 1926. Nobody had yet produced a successful talking feature picture, and nearly all of the world's film production houses were, basically, scared stiff of the possibility of sound film. The cost of equipping all the world's theatres with sound was astronomical. Anyway, people seemed to be quite happy with silent films, and why should producers want to make their present silent films obsolete. These talkie experiments were almost totally ignored — until someone named Al Jolson came along.

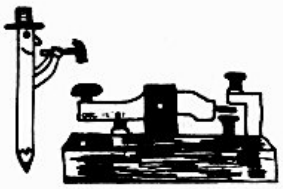
"De Forest Phone-Films, were experimental and their acting is very, very stilted. I want you to listen to the excellent sound quality they achieved — it is surprising — and I want you to notice the number of camera set-ups used through the film. The camera is quite mobile, as sound-on-film can be readily edited. When Warner Bros decided to use sound-on-disc, the camera was rendered immobile by comparison. This little film, made over 60 years ago is quite awful from a dramatic point of view, in fact the acting is absolutely hilarious. But the technology is a real credit to the technicians who made it in the winter of 1926 — and one of those technicians, Allen Butement, who did technical work on the glow tube in the recorder is with us today.

"The film, *The Antidote* was shown in Melbourne at the Majestic Theatre, in Flinders Street, 1927, which was specially wired for the purpose. Another two years were to pass before sound was generally introduced to Australian theatres.

"The last film was *Melbourne Today* (1931) the first talkie documentary on Melbourne, produced by Frank Thring Senior's "EFFTEE" film studios. The sole surviving nitrate print of the film was located by Peter Wolfenden VK3KAU, in the early 1970s, and has been copied by the National Film Archive in Canberra."

These films were very well received and a vote of thanks was given to Chris Long. This concluded the 1987 Radio Amateur Old Timers' Luncheon.

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Gosh! I nearly forgot the deadline. I have just finished the VK/ZL/O Contest and have had no time to collate the results. The low bands were disappointing this year with plenty of noise, both atmospheric and SEC transformer noise, but I think everyone had fun on the higher bands, especially 20 and 15 metres, with a good chance, with a little luck, for DXCC in a mere day of operating.

ZL

I have received a letter from Gary ZL1AN, who is the author of the new *Morseman* column in *Break-In*. I was surprised when I wrote to *Break-In* that they did not previously have a Morse column, so congratulations Gary. Gary says, "I try to skulk at the bottom of 80 metres from about 2300 to 2400 NZST." When I figured out what that is in EST or UTC I'll see if I can make it.

G

Tony G4FAI, wrote asking if any Australian Knights know of the use of American Morse on Australian land-lines. He has discovered that one of the repeater stations on the line between Port Augusta and Albany has two sets of operators to interfere between two different Morse codes, presumably International and American. This was apparently at Eucla. Can anyone help? Just how extensively was American code used, and where? And when and how was it replaced by International code?

VE

Licence testing for the VE Morse test, effective October 15, 1986, from Moe Lynn VE6BLY, courtesy of Tony G4FAI.

"Tests are administered by three appropriately qualified amateur examiners on behalf of the Department of Communications, although candidates still have the option to be tested by the Department. There are two levels of examination. The Amateur Class requires sending and receiving at 10 WPM for three minutes, including plain language, figures, punctuation, Q codes, and emergency signals. Candidates may send on a hand key, semi-automatic key, or an electronic hand key. When receiving, the text must be legibly copied by hand or by typewriter.

"The Advanced Amateur test has similar requirements, but at 15 WPM."

Morse is the only form of communication permitted on the lower part of most bands up to 144 MHz, not by 'gentleman's agreement' but by legislation. CW operating seems to have retained its status in VE and, although testing has been "modernised", it looks as though it would be easier than our present system in VK. Especially by encouraging the use of modern keyers and typewriters.

Phil VK3CDU and I were having a rag chew about the high-speed receiving test which was hopefully performed at the Ballarat Hamvention on November 1.

Reflecting that it is really a high speed writing test, we wondered if the use of a typewriter would be okay!

Bill ZL4QY, wrote me a letter in August, which I lost. Well, I found it, Bill! Bill asks me to pass on the following message; "I wish to thank the following amateurs and their wives, for their warm hospitality and great company afforded me during my last visit. Also, for showing me the various sights in so many locations: VK3s DXM, QU, CAL, CD, CVT, BPW, BRU, BUR, ADX, AIG; with greetings to BKU, BNO, AUN and VK7CW. Bill is a member of the Friday QRO net on 3.510 MHz at 9.30 pm EST.

8044ABM

Last month I mentioned the new Curtis chip — it works! I finally built it up on an old piece of breadboard and the results are really spectacular. The positive weighting can be adjusted from zero to a complete absence of spaces, and the negative weighting from zero to a complete absence of dots. The speed control is excellent and the analogue meter works well. Dot-Dash memory can be disabled at the flick of a switch (old A or B types), and side-tone volume and pitch are adjustable with two pots.

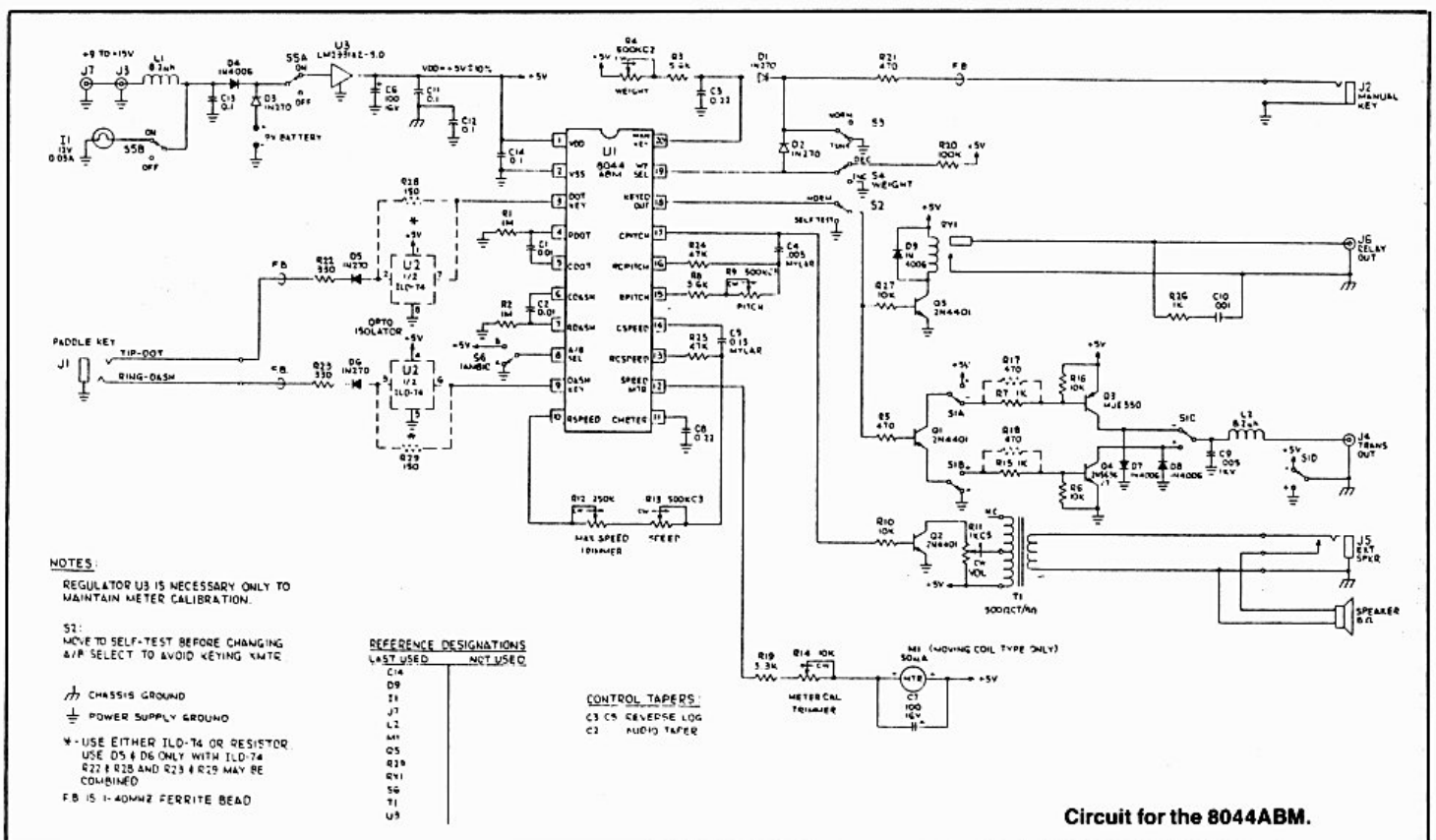
I used BC547 transistors in place of the 2N4401s in the circuit and took the output to the rig straight from Q1. If anyone knows of a board which may be available, or if anyone with the expertise would care to make a few boards, please let me know, as there will be a market for them in the near future. Don't wait for a kit, though. The circuit is simple enough to build on veroboard, so, to anyone who can swing a soldering iron, have a go.

TWO-METRE MORSE

Since investing a lot in two-metre equipment I have found a general scarcity of CW on two-metres. Is anyone there? Am I on the wrong frequency, 144.025 and 144.100 MHz? How about Tuesday evenings for some two-metre Morse? I will be calling and listening for contacts. I don't get out well yet, but with a few to chat to I think it will be fun, and not as much QRN, QRM, either.

Best 73, Gil VK3CO.

ar



Circuit for the 8044ABM.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA-MEET 1987

What a great weekend! It went like a well-oiled machine, with scarcely a hiccup — so smoothly in fact that it was easy to forget the months of hard work and planning that went on behind the scenes to make this get-together such an enjoyable event. The VK5 girls "did us proud" and thought of everything, down to the smallest detail.

Our program began on Saturday, September 26, at 9.30 am, when we arrived at Walford Anglican School for Girls, to be greeted by Maria VK5BMT and our VK5 hostess. We were issued with neatly printed name and call sign tags for easy identification, and a plastic bag of South Australian tourist information. Any initial shyness was speedily dissipated as we matched faces to voices, and it was a great feeling to be among friends, not strangers. (After all, we have already met many times on air, haven't we?).

Some had travelled very long distances. From New Zealand came Vicki ZL1OC, OM Colin ZL1CS, and daughter Angela (who currently lives in Melbourne). Poppy VK6YF and Les VK6EB made the trip from Western Australia; from Queensland, Margaret VK4AOE and OM Erwon. Nancy VK2NPG was accompanied by OM Dale, and a four-legged fluffy rug answering to the name of *BeePee*.

OM Dan and myself owe our thanks to Doug VK5PDT and Bev (now an ALARA member), who drove us to Adelaide from Renmark, giving us a chance to see a little of the South Australian countryside on the way down and back without having to worry about the traffic.

From Victoria, we had our President, Marilyn VK3DMS and Geoff VK3ACZ (who made the trip although he had not been well), Margaret VK3DML and George VK3AGM, Valda VK3DVT and Pat Stuart, Joan VK3NLO and Graeme VK3AGS and Muriel, accompanied by OM Neil VK3KNM and harmonics Simon and Charlene.

VK5 was, of course, well represented wit the VK5 Representative and ALARA-Meet Co-ordinator, Maria VK5BMT and Keith VK5MT, Jenny VK5ANW, ALARA Secretary, and President of the VK5 Division of the WIA, accompanied by daughter Wendy, Marlene VK5QO and Brian VK5CA. Denise VK5YL and David VK5RN, Joy VK5YJ, Gill (noted for her culinary prowess) and Bill VK5AWM, Christine VK5ZCQ and Geoffrey VK5TY, Carol VK5PWA, Meg VK5AOV and David VK5OV, and Sue VK5AYL, with her little son. Our photographer was Treva VK5ZIS.

On display were photographs, QSL cards, the famous Mouse House and unusual Cinderella Doll, and a very attractive ALARA logo in wood donated by Judy VK5BYL.

Most of the YLs wore ALARA badges, and many also sported the badges of DX-YL groups such as WARO, BYLARA, etc.

The time slipped by as we talked our way through morning tea, group photographs, and a tasty lunch in pleasant surroundings.

After lunch the Mouse House special effort was won by Heather VK2HD. A somewhat perplexed David VK5OV won the Cinderella Doll (I am sure he will find a suitable use for it!).

Jenny VK5ANW, presented all ALARA members with an attractive Souvenir Notebook featuring Sturt's Desert Pea and the words *South Australia. ALARA-MEET 1987.* The OMs each received their choice of a bottle of wine, kindly donated by Wolf Blass.

Vicki ZL1OC, conveyed greetings from WARO to ALARA, and Colin ZL1CS, following a lucky numbers draw, presented WARO gift teaspoons to the winners, Margaret VK4AOE and Marilyn VK3DMS. Colin gave information about various ZL Awards, in particular the WARO Century Award (details October AR).

A tour of the city of Adelaide was organised with the minimum number of "locals" taking the maximum number of visitors. In this way we were able to relax and see the sights without the inconvenience of driving, and the risk of someone getting lost. Geoffrey VK5TY gave an informative and very interesting commentary on two-metres as we were chauffeured around the city. A map of the route, thoughtfully provided by Maria, showed us where we were at all times. I have been told that even some VK5s learned things about Adelaide they had not known before, and speaking as one of the visitors, I would say we could not have had a better guided tour.

Afternoon tea, hosted by the VK5 Division, was held at the Burley Griffin Building, surprisingly a former incinerator designed by Burley Griffin, and one of only four still in existence. The building, now listed by the National Trust, bears the stamp of his expertise, and it is hard to envisage it ever being used to dispose of rubbish! It is now headquarters of the VK5 Division.

Jenny donned her other hat and introduced us to members of the VK5 Council, and we were joined by other VK5 members, including Rick VK5BEG and his wife Gwen.

Marilyn officially presented the Florence McKenzie Trophy to the VK5 Division for safe keeping, and gave sprays of flowers to the VK5 girls who have worked so hard to make our get-together a success. Our visit concluded with an inspection of the building.

Dinner that night was held at the home of Meg VK5AOV and David VK5OV, and we talked our way through a truly sumptuous repast. The evening concluded with some rather unusual awards — ie for getting lost etc.

The weather was kind to us, too kind in fact. It was the hottest September night in Adelaide since records were first kept in 1857!

Sunday morning saw us gathering at Victoria Park Racecourse for a tour of the Grand Prix Circuit (no, not at 300 kilometres-per-hour), then our cavalcade headed towards the Adelaide Hills and the Cleland Native Fauna Centre, with spectacular glimpses of the city from Greenhill Road, and delicate wild-flowers providing splashes of colour.

We spent an hour or so at Cleland forming a nodding acquaintance with some of the animals and birds. Joan VK3NLO, struck up a friendship with a white cockatoo who seemed to like the YLs, but not the OMs. (Wonder why?).

Eventually, we were on our way again for a brief, rather hazy look at the city from the top of Mount Lofty, before heading for the QTH of Denise VK5YL and David VK5RN. Denise directed us to our parking places as expertly as any traffic warden!

A barbeque was prepared in their beautiful garden, more delicious food. Of course, we finally talked ourselves hoarse.

It was sad to make our farewells after such a wonderful weekend, but we have many happy memories, friendships, mementos, (and a little extra weight after all that good food), to remind us of it.

To the VK5 Division, we would like to express our appreciation of your hospitality.

To Maria and the VK5 ladies who looked after us so well we can only say a very big *thank you*. Yours will be a hard act to follow.

ALARA CONTEST — FIVE YEAR TROPHY

By the time you read this, the ALARA Contest, held on November 14, will be over.

An interesting feature this year is the finalisation of the Five Year Trophy, which will be awarded to the YL with the highest aggregate ALARA contest score from 1983-1987 inclusive.

Progress scores up to, and including 1986, are as follows:

See below. . .

NEW/OLD CALL SIGN

The following interesting item regarding Audrey VK4NAD has been received from the Brisbane North Radio Club:

When Alf Gover VK4NAD, became a silent key in December 1986, it was feared his call sign might be lost to the Gover family. However, Alf's widow, Audrey, continued her studies at Mount Gravatt TAFE and we are very pleased to report that Audrey was successful in the recent NAOCP examination.

DOTC has issued Alf's old call sign, VK4NAD, to Audrey, thus maintaining a sentimental link and tradition of radio communication in the Gover family.

Audrey intends to continue her studies and eventually upgrade to the full call. Audrey may be heard most weekdays on the Kingfisher Net with Alf VK4OL, on 3.586 MHz at 2330 UTC, chatting to Pat VK4NPR and sundry OMs.

NATIONAL PARKS FESTIVAL

On September 19 and 20, a special event amateur radio station was in operation from Chatsworth, in the Peak District National Park (England). This was to coincide with the Festival of National Parks. Her Royal Highness, the Princess of Wales was guest of honour on this occasion.

The intention of the special station was to have world-wide contacts with as many amateur radio stations as possible, situated in National Parks.

Kim VK3CYL	3501	Aimee FK8FA	704	Hisako JJ1LQI	233
Wendy VK4BSQ	2818	Marg VK2AHD	599	Marlene VK2KFQ	227
Gwen VK3DYL	2418	Connie VK4ATK	521	Ruthanna WB3CQN	216
Joy VK2EBX	1969	Jenny VK5ANW	511	Pearl ZL2QY	214
Bev VK6DE	1956	Joyce VK2DIX	428	Celia ZL1ALK	200
Jill VK4ASK	1571	Shirley ZL1MY	419	Paula PA0ULA	163
Jan VK3HD	1412	Meg VK5AOV	403	Ethel ZL1BWQ	163
Mavis VK3KS	1383	Eileen ZL1BRX	400	Bron VK3DYF	134
Val VK4VR	1215	Margaret VK6QM	325	Winifred ZL1BBN	121
Helene VK7HD	1209	Joan VK3NLO	287	Lesley ZL1BOR	113
Denise VK5YL	1072	Gail ZL1FY	268	Zdena OK2BBI	102
Elva ZL1BIZ	1038	Shirlee KQ7Y	265	Dot VK2NVQ	89
Freda VK2SU	1014	Maryanne WA3HUP	263	Clarrie ZL1BOZ	81
Margaret VK4AOE	939	Sue VK2PLG	258	Diana G4EZI	56
Valda VK3DVT	921	Valerie VK4VKT	258	Daphne VK2KDX	34
Marilyn VK3DMS	788	Bobbie VK2PXS	255	Anny DF2SL	10
Elizabeth VE7YL	712	Dorothy VK2DDB	242		
Poppy VK6YF	709	Betty VK2KYL	240		

One YL chosen to try and make the contact was Biny ZL2AZY, also an ALARA member. Unfortunately, conditions were atrocious, and the attempt was not successful. However, plans are afoot to run a weekend radio link with national parks throughout the world once a year and, hopefully conditions will be better next time.

Heather VK2HD, was standing by to relay, but was unable to hear England or New Zealand. (Conditions must have been bad, Heather, if you were unable to hear either station!).

—Contributed by Heather VK2HD

THE YL-YEAR 1988 AWARD

YLs world-wide are very active in the hobby of radio. The radio greeting 88 is well-known, and not to be thought away from the amateur bands.

YLs and 88 belong to each other. For that reason, we at DIG PA (the Dutch section of the Diplom Intressen Gruppe), want to give some special attention to the year 1988, and give YLs the opportunity to promote a unique award. This award asks for special attention during the whole year.

In the award rules everything revolves around the number 88.

Every licensed radio amateur and SWL can apply for the award. No band or mode restrictions apply, also mixed mode.

SWLs mention in their log "heard in contact with. . ."

Amateur and SWL YLs — try to be as active as possible!

RULES

CLASS 1: Contact eight YLs every month, during 11 months to gather 88 points — 11 (months) X 8 (contacts) = 88 points.

It is permissible to contact the same YLs in the second month as in the first month, etc, so one YL can be mentioned 11 times in the log.

Operators can decide for themselves which months they are active.

CLASS 2: Contact 11 YLs every month for eight months. Other rules the same as Class 1.

On February 29, 1988, Leap-Day, every YL counts as two points. A maximum of five of those contacts can be used as Joker Points, ie if a YL contact is missed one month these double points can be used. The points of Leap-Day can be used only once. This means, for example, if a YL is contacted on April 4, and not enough YLs are gathered in April, and the same YL was contacted on February 29, the same YL call sign can be used twice in April. This YL call sign then counts as three points and a maximum of five YL contacts from February 29 can be used. The reason why Leap-Day is special is that in bygone days YLs had special rights on this day, ie a YL was allowed to propose marriage to an OM!

The YLs in Holland will try to join in as many nets as possible, and hope YLs world-wide will try to do the same as every YL contact counts for this award.

Cost of the award is 10 IRCs.

It is not necessary to receive QSL cards — a log signed by two other radio amateurs will suffice. SWL YLs need to have QSL cards for verification.

Awards will be available until January 1990 (outwards postmark, December 31, 1989). Applications to be forwarded to: Award Manager, M Wolf-Wildeboer PA3CIS DIG 4055, Plotenweg 14b, NL-8303 E J Emmeloord, The Netherlands.

BITS AND PIECES

While taking a round-about route back to Yeoval from Adelaide, it was great to meet Ivan VK5NSI and Audrey, at Tailem Bend, catch up once again with Daphne VK2KDX, and have lunch with Mavis VK3KS and Ivor VK3XB. While there we also met Bron VK3DYF, our intrepid Newsletter Editor, and Gwen VK3DYL, and spent a pleasant time (yes, you guessed it) talking.

Thank you all for your hospitality, and making our first holiday in years so enjoyable.

Poppy VK6YF, Bev VK6DE, Peggy VK6NKU and other VK6 ALARA members chat on 80 metres at 1200 UTC, and would be very pleased to welcome any other YLs who would like to join them.

Congratulations to Elizabeth VE7YL, who gained first place in the CW section of the YLRL/OM 1987 Contest.

Our sympathy to Bobbie VK2PXS and Mavis VK3BIR, who both recently lost their mothers. To Maria VK5BMT whose father passed away, Trish VK6QL, on the loss of her OM, Harold VK6QD, and Gwen VK3DYL on the loss of her OM, Tom. Our thoughts are with you.

Congratulations to Grace, formerly VK7NNN, now VK7TN. I am sure you will give the new call sign a good workout!

During July, Bev VK6DE and Brian VK6AI, had an enjoyable four weeks trip to the Kimberley region of VK6, leading a group from the Geraldton Four Wheel Drive Club. They travelled through some wild country, saw spectacular scenery and wildlife, and travelled over 8000 kilometres, fortunately with no major vehicle problems. During the trip they had daily contact with Art VK6ART and the Travellers' Net. They also contacted amateurs in Geraldton and Albury. All voted it the best trip they had ever been on.

NEW MEMBERS

A very warm welcome to:

Bev, wife of Doug VK5PDT, Sue VK5AYL (was VK2DCR), Jasmine G4KFP, and Jeanette Arter, G/SWL.

Welcome back to Joyanne VK5BJH and Kay WA0WOF.

Great to have you all in ALARA.

CONTEST LOGS

Logs for the ALARA Contest must be received by the Contest Manager by December 31, 1987.

Marlene has changed her QTH and the new address is: Marlene Perry VK2KFQ/3, 218 Ninth Street, Mildura, Vic. 3500.

In conclusion, a very Happy Christmas to all.

Until 1988, 73/33,

Joy VK2EBX

ar

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

One of the satisfying aspects of this position is that I occasionally receive reports back from students who have asked for help or information.

Most of my mail comprises requests for sample papers or CW tapes, or for information about classes, or text books. When controversial issues relating to educational matters are aired, I receive comments from a range of interested parties.

So it is very pleasing to receive the occasional letter thanking me for information or materials, and awarding me some credit for the candidate's subsequent examination success. It is, however, my firm belief that no amount of outside help can be of any value unless the candidate has the drive, enthusiasm ad determination to make a good effort on his/her own behalf.

A few recent letters have demonstrated these qualities and a high level of persistence as well. One VK5 wrote joyfully of having just received a full call after sitting every examination for more than 10 years. He is now in his late 70s.

A VK6, likewise, sat all full call examinations for about five years, and, at nearly 70, has now succeeded.

In other cases, students who had previously asked for sample Novice theory examinations have written in straight after gaining the Novice licence for sample papers for AOCP examinations. Many of these are in the "senior citizen" class.

We must not neglect the possibilities of recruiting new amateurs from the ranks of those at, or past, middle age.

Some of them may have had an interest in radio in their youth but not the time or funds to operate. Others once introduced to the hobby have seen it as an ideal pastime in retirement. Time and money are a little easier, and participation is not limited by the common problems of aging such as restricted mobility.

The "mature age" recruits have much to offer the hobby and the Institute. As well as their interest and enthusiasm, they bring in a range of technical, educational and managerial skills from their fields of employment, years of experience in problem solving and working with others and contact networks that have taken years to build.

It puzzles me, though, that in a number of cases these older candidates do not seem to be getting much support from their local groups. I try, where possible, to put potential amateurs in touch with the nearest group or club so that they can join in activities and get some assistance in their own residential areas, but on a few occasions I have heard back that no help was forthcoming from the club.

I do not have time to notify the clubs if I have passed on information, but it has usually been my experience that amateur groups are generally very welcoming and helpful to newcomers.

Perhaps we forget that the newcomers may be new not only to the group, but also to the hobby, and we do use terms and jargon that are a little daunting to the uninitiated. Remember how you felt when your doctor explained something in medical terms, or your teenagers tried to talk to you in their language?

In passing out this information I am, of course, restricted to the clubs listed in the directory in the Call Book. If there are clubs which are not listed, please could someone let me know about them, and especially if they offer classes whether regularly or occasionally.

In fact, I would be very pleased to update my list of classes all round, as I have not heard from some for some time.

I would also like to build up a list of amateurs who would be prepared to offer help to new recruits in areas without an active club. It is very difficult to gain a licence without any outside help.

Perhaps I could start up a "Penfriends" group for the really remote triers.

I would like to take this opportunity to wish all readers a happy and safe holiday season. May the November examinees all receive a nice new call sign for Christmas.

73, Brenda VK3KT

ar

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

DECEMBER

4 — 6 ARRL 160 metre CW Contest
5 — 6 TOPS 3.5 MHz CW Contest
12 — 13 ARRL 10 metre Contest
19 Ross Hull Memorial VHF/UHF Contest begins (Rules November issue)
27 — Canada Day Contest

JANUARY 1988

— 10 Ross Hull Memorial VHF/UHF Contest concludes (Rules November issue)
16 — 17 Hungarian DX Contest
29 — 31 CQ WW 160 metres CQ Contest
30 — 31 YL ISSB CW QSO Party

ARRL 160 METRE CW CONTEST

TIMES: 2200 UTC Friday to 1600 UTC Sunday, December 6.

This is the 18th year for this "Top Band" activity. Exchange is between US Stateside, VE and DX stations. DX to DX is not permitted for contest credit.

CLASSES: Single operator, and multi-operator, single transmitter.

EXCHANGE: RST and ARRL section number for W and VE stations. RST only for DX.

SCORING: Contacts between stations in W and VE count two points. DX is five points.

MULTIPLIER: DX stations use ARRL sections only.

FINAL SCORE: Total score times the number of ARRL sections.

AWARDS: Certificates to the top scoring station in each DX country and ARRL section.

ENTRIES: Deadline for logs is January 6, 1988. Send to ARRL Communications Department, 160 Contest, 225 Main Street, Newington, CT 06111, USA.

RESULTS OF 1986 CQ WW CW CONTEST

AUSTRALIAN RESULTS

VK2BQQ	All band	505 377
VK8AV	All band	192 468
VK3NI	All band	179 928
VI5AGX	All band	35 030
VK6HD	28 MHz	80 448
VK6SM	28 MHz	74 472
VK4SF	28 MHz	1 947
VK4XA	21 MHz	185 674
VK2APK	14 MHz	329 278
VK4TT	14 MHz	101 136
VK3AHQ	14 MHz	67 080
VK2EKY	7 MHz	96 560
VK3BEE	1.8 MHz	1 534

VK4TT is a trophy winner for his 14 MHz effort, in the single operator, single band section.

The winner of the single operator, all band section for Oceania was Philip David YB0ARA.

COMMONWEALTH CONTEST 1988

Participation in this contest will count towards the HF contest championship 1987-1988 for UK entrants.

TRANSMITTING SECTION

The general rules for RSGB HF contests, as published in the January 1987 issue of *Radio Communication*, will apply.

Date and Time: From 1200 UTC on Saturday, March 12, to 1200 UTC Sunday, March 13, 1988.

Sections: Single operator entries only from members of the RSGB resident in the UK and radio amateurs licensed to operate within the British Commonwealth or British Mandated Territories. Entries from GB, aeronautical or maritime mobile stations will not be accepted. Entries may be single-band or multi-band. Single-band entries should show contacts on one band only: details of contacts made on other bands should be enclosed separately for single band awards.

Band and Mode: A1A only in the 3.5, 7, 14, 21, and 28 MHz bands. In accordance with IARU recommendations, contestants are requested to operate within the lower 30 kHz of each band, except when contacting novice stations that operate above 21.000 MHz and 28.100 MHz.

Exchange: Contacts may be made with any station using a British Commonwealth call sign except those within the entrant's own call area. UK stations may not work each other for points. A contact exchange consists of RST and three figure serial number commencing with 001 and increasing by one for each successive contact throughout the contest. Serial numbers when sent from non-competing stations, must be recorded.

Scoring: Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first three contacts with a Commonwealth call area on each band. Call areas for use in the contest are listed in the accompanying table. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU, and GW) count as one call area, with the exception of GB5CC, the special event station. GB5CC will be active throughout the contest and will count as a separate call area for all contestants including those in the UK.

Documentation: Separate log sheets (HFC1) for each band must include UTC, call sign of station worked, RST/serial number sent, RST/serial number received and points claimed. Separate band totals should be added together and the total claimed score entered on the cover sheet. It is important that logs are carefully checked for duplicate contacts. Unmarked duplicate contacts for which points have been claimed will be penalised 10 times the number of points claimed, and logs containing in excess of five will normally be disqualified. Your entry should include a signed declaration stating that the rules and spirit of the contest and the terms of the entrant's licence were observed.

Name and Address for Logs: Logs should be addressed to the RSGB HF Contest Committee, Alan Gray G4DJX, PO Box 73, Lichfield, Staffs WS13 6UJ, England. All entries become the property of the RSGB. In the event of any dispute, the ruling of the Council of the RSGB shall be final.

Date for Entries: Adjudication of this contest will commence on Monday, April 11, 1988. Any entries received after this date may be excluded from the contest. Overseas stations are therefore advised to forward their logs by air mail.

Awards: The winner will receive the Senior Rose Bowl, and the runner-up the Junior Rose Bowl. The leading UK station will receive the Col Thomas Rose Bowl. Certificates of merit will be awarded to the a) first, second, and third placings in home and overseas multi-band placings, b) the leading home and overseas single-band entries on each band, c) the leading station in each call area.

Receiving Section: Dates and times as above. Only the entrant may operate his/her receiving station for the contest. Holders of a transmitting license for frequencies below 30 MHz are not eligible to enter.

To count for points, a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band for the purpose of scoring.

When both stations in contact are heard, they should be logged separately and points claimed for both entries, provided they are both outside the entrant's own call area. Each completed log entry will score five points. In addition, a bonus of 20 points may be claimed for the first three stations heard in each British Commonwealth call area on each band. All British Isles prefixes count as one call area.

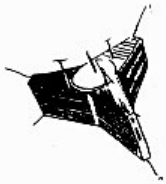
A separate log is required for each band. Logs should show date/time UTC, call sign of station heard, RST/serial number sent by station heard, call sign of station being worked and points claimed.

The Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

COMMONWEALTH CALL AREAS The following call areas are recognised for the purposes of scoring in the 1988 Commonwealth Contest.

A2	Botswana	VP8	S Shetland Is
A3	Kingdom of Tonga	VP9	Bermuda
C2	Nauru	VQ9	Chagos
C5	Gambia	VR6	Pitcairn
C6	Bahamas	VS5	Brunei
G*	See note below	VS6	Hong Kong
H4	Solomon Is	VY1	Yukon
J3	Grenada	VU	India
J6	St Lucia	VU7	Laccadive Is
J7	Dominica	VU7	Andaman & Nicobar Is
J8	St Vincent	YJ	Vanuatu
P2	Papua New Guinea	Z2	Zimbabwe
S7	Seychelles	ZB2	Gibraltar
T2	Tuvalu	ZC4	Cyprus (UK Bases)
T30	W Kiribati	ZD7	St Helena
T31	C Kiribati	ZD8	Ascension Is
T32	E Kiribati	ZD9	Tristan da Cunha, Gough Is
V2	Antigua, Barbuda	ZF	Cayman Is
V3	Belize	ZK1	Cook Is
VE1	Maritime Provinces	ZK1	Manihiki
VE1	Sable Is	ZK2	Niue
VE1	St Paul Is	ZK3	Tokelau
VE2	Province of Quebec	ZL0	New Zealand
VE3	Province of Ontario	ZL1	New Zealand
VE4	Province of Manitoba	ZL2	New Zealand
VE5	Province of Saskatchwean	ZL3	New Zealand
VE6	Province of Alberta	ZL4	New Zealand
VE7	Province of British Columbia	ZL7	Chatham Is
VE8	North West Territories	ZL8	Kermadec Is
VK1	Australian Capital Ter	ZL9	Auckland & Campbell Is
VK2	New South Wales	3B6 /3B7	Agalega & St Brandon
VK3	Victoria	3B8	Mauritius
VK4	Queensland	3B9	Rodriguez Is
VK5	South Australia	3D2	Fiji
VK6	Western Australia	3D6	Swaziland
VK7	Tasmania	4S	Sri Lanka
VK8	Northern Territory	5B4	Cyprus
VK9L	Lord Howe Is	5H	Tanzania
VK9M	Mellish Reef	5N	Nigeria
VK9N	Norfolk Is	5W	Western Samoa
VK9X	Christmas Is	5X	Uganda
VK9Y	Cocos (Keeling) Is	5Z	Kenya
VK9Z	Willis Is	6Y	Jamaica
VK0	Heard Is	7P	Lesotho
VK0	Macquarie Is	7Q	Malawi
VK0/ VP8 /ZL5	Antarctica	8P	Barbados
VO1	Newfoundland	8Q	Maldive
VO2	Labrador	8R	Guyana
VP2E	Anguilla	9G	Ghana
V4	St Kitts, Nevis	9H	Malta
VP2M	Montserrat	9J	Zambia
VP2V	British Virgin Is	9L	Sierra Leone
VP5	Turks & Caicos Is	9M2	W Malaysia
VP8	Falkland Is	9M6/8	E Malaysia
VP8	S Georgia	9V	Singapore
VP8	S Orkneys	9Y	Trinidad & Tobago
VP8	S Sandwich Is		

GB5CC RSGB HQ Station
G* denotes G/GB/GD/GI/GJ/GM/GU/GW



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, VK5AGR BBS, VK5ZK BBS and the UoSAT Bulletin Board.

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication published on behalf of AMSAT-Australia by Graham VK5AGR, now has 200-plus subscribers. Should you also wish to subscribe then send a cheque for $20 made payable to AMSAT-Australia and post to: AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

FIRMWARE FOR TNC-2 FO12 OPERATIONS

Users of FO-12 are suggested to use the WA8DED V2.0 Firmware for TNC-2 instead of the originally installed TAPR Firmware.

After some experience with several stations using TNC-2, the DED Firmware operates more reliably on FO-12 Mode-JD operations (as well as on terrestrial packet). With the TAPR-Soft you are sometimes ignored by the satellite after logon into the mailbox, caused by a possible protocol bug.

Ask your local PR-Group for the TNC-2 WA8DED Firmware, which is public domain. I am using WA8DED-Firmware also on TNC-1 and it works well on FO-12 BBS.

Vy 73 Peter DB2OS
Member of NORD > < LINK Packet Group,
Northern Germany

In addition to my message above, (about better operations with TNC2-DED soft on FO-12) I must say, that this will not help all problems. I guess, you have high gain receiving antennas and a preamplifier directly under your antenna. You have a good transmitting system with the suggested 100 watts EIRP, or more? Your modem is okay and you have stored the right parameters for FO-12 access in your TNC (MAXFRAME, TXDELAY, FRACK).

Do you have problems with uplinking sometimes?

Over Europe it is often mysterious. . .for some minutes FO-12 does not receive anything from any station. In most cases, a few minutes later all is well again and Down/Uploading continues. It makes no difference how much power you are using! I have made some tests, together with DL1CF. I am using less than 10 watts with my TS-700G, Heinz is using around 80 watts with a TS-711E, including a preamplifier for testing, like 10 dB more EIRP. We have discovered that when I get in trouble, he does also.

Could this be a problem due to heavy FM-voice stations in the satellite band? You can really hear them on .910 and .930 uplink when JA is on which may be a problem only in southern Europe! Or is it QSB at the satellite receiving antenna? Or maybe even a software bug in the FO-12 AX25 handler?

Many questions and no answers. . .

If any readers have made the same observations please send a report via FO-12 BBS.

73 Peter DB2OS

UOSAT SPACECRAFT

Several stations have inquired why the UO-9 VHF downlink appears to be 'stronger' than UO-11 on similar passes. Firstly, the UO-11 transmitter yields between 220 mW (eclipse) and 480 mW (sunlit) RF output dependent on battery voltage (the power taken by the VHF transmitter decreases as battery voltage decreases deliberately to avoid excessive discharge). UO-9 generally yields around 475 mW and is rarely in eclipse at present. Secondly, UO-11 is at 698 km and UO-9 at 478 km thus, when overhead, UO-9 is some 3.2 dB 'closer'! Consequently, but also dependent on the ground-station antennas used, UO-9 can be up to 6 dB stronger than UO-11 under certain circumstances.

UOSAT-2 DIGITAL COMMUNICATIONS EXPERIMENT

A significant step has been made in the UoSAT-2 Digital Communications Experiment (DCE) program. Whilst the DCE has been supporting digital store-and-forward communications for radio amateurs for almost two years, engineers at UoS have also been using the DCE to evaluate the electronic components which will be needed to build a full-scale store-and-forward satellite. As part of this study, Stephen Hodgart and Jeff Ward G0/K8KA, at UoS have been developing software error-correcting codes to detect and correct radiation-induced single event upsets (SEUs) in the DCE RAM.

The DCE carries 96 kbytes of RAM for message storage (as well as 28 kbytes for programs). This message store (called the RAMUNIT) is composed of high-density CMOS RAM ICs; each IC carries either two kbytes or eight kbytes of memory. It is impractical and inefficient to provide hardware circuits to detect and correct memory upsets on this much memory in such dense ICs. Hence, the need for software memory protection.

The new software, which has been loaded to the DCE over the last few weeks, implements error correction codes which can detect and correct up to eight bit errors in a 128 byte block of memory.

Although it will be a month or so before enough data is collected to make reliable statements, early indications are that this is more than enough correction capability to protect messages in the RAMUNIT from corruption.

In order to be able to engineer a RAMUNIT consisting of several megabytes of memory correctly — such as will be used on UoSAT-C, it is important to know how frequently and where in the satellite's orbit RAM errors occur. To achieve this, the new DCE software logs each error occurrence in a message which can be downlinked to any DCE ground station. This message contains complete information about the error location and extent, and a time stamp derived from the UoSAT-2 telemetry system real-time clock.

For UoSAT listeners, there is a new counter in the DCE status frame. This counter is labelled RAM=nnnn, where nnnn is the number of errors detected in the RAMUNIT since September 27. The other counter (EDAC=xx) counts the errors detected by hardware circuits on the program memory. (This counter has logged more than 20 errors since monitoring started a year ago).

HAPPY BIRTHDAY UOSAT-1

UoSAT OSCAR-9 (UoSAT-1) completed six years operation in orbit this week. UO-9 was launched from the WTR, Vandenberg Air Force Base, California, on October 6, 1981, on-board a Delta 2310 accompanying a NASA Solar Mesoshpere Explorer satellite. The spacecraft continues to perform well in orbit, supporting daily experiments on a weekly schedule under automatic control of the on-board computer.

UO-9 was launched into an initial 550 km sun-synchronous polar orbit, and the effects of atmospheric drag were expected to cause the spacecraft to re-enter the Earth's atmosphere and burn up around 1986/7. However, the orbital decay experienced over the last few years has been considerably less than expected and UO-9 will probably remain in orbit until 1991/2. The spacecraft on-board electronic systems continue to perform without noticeable degradation — well beyond the two years expected at launch!

The UO-9 mission has not been without its problems though — primarily caused by shortcomings in the communications links and the unreliability of the on-board computer command interface to the tele-command sub-system. The effects of these limitations, however, have been largely overcome by the use of a sophisticated software Diary for the on-board computer — originally developed for the later UoSAT-2 satellite!

FOOTNOTE

Without the UoSAT Bulletins, this particular column would not have existed over the last year, and I salute the UoSAT team for their dedication and application of UoSAT's 1 and 2 in the dissemination of current news and topics. News has not been readily forthcoming, primarily because by the time the magazine reaches the end-user the news is very much out of date.

The electronic bulletin boards available to most satellite users these days contain unlimited satellite information and news, and consequently are a valuable source of information.

Consequently, this column has degenerated to an archival source of "non-dated" technical information and newsworthy events from within the Amateur Satellite Service.

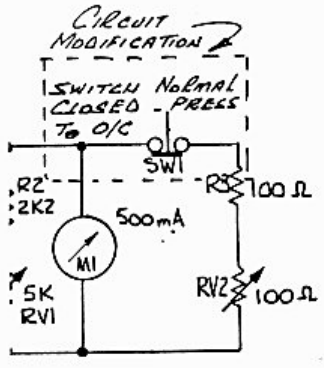
In closing this month, may I extend Seasons Greetings to all and at this stage 1988 promises to be another exciting year with the expected launch of Phase 3C early in the year.

de Colin VK5HI
ar

CORRECTION

Please refer to the circuit diagram in reference to page 18, AR October 1987. This modification clarifies the "Setting Up Precedure" in col 1, page 19.

Also, an error appeared in the diagram, Figure 1, page 22, of October AR. Note at the base of the coax should be 15 metres, not 80.



Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN SEPTEMBER

WORKED ALL STATES VHF
172 Charlie Gnacearini VK3BRZ (two-metres).

DXCC
Phone 359 Harry Cox VK4OX

WORKED ALL BRITISH AWARDS
The overseas liaison officer, Bob Nash G4GEE, has written to say that Cyril Roberts VK6OE, has successfully claimed the WAB overseas introductory award and the WAB Bronze Award, the first issued to VK. Congratulations on this distinction are extended to Cyril.

CP5AA AWARD

Tribute to the Heroines of the Coronilla

This certificate is awarded by the Bolivian Radio Club of Cochabamba (Zone 5), to all licensed foreign, as well as Bolivian amateurs who can verify having had contacts with 89 foreign stations. The applicant, Bolivian or foreign, may not include contacts with other stations from his/her own country.

One QSL must be submitted for each letter and number of the following quotation in this manner:

For the letters	Use the first letter of the call sign's suffix (Ex CP5AA)
For the numbers	Use the zone number (Ex CP5AA or C56AA or 5W1AA)

The quotation to complete, in Spanish, is:

DIOS Y PATRIA HE AQUI EL ALMA DE LA MUJER COCHABAMBINA EL SECRETO DE SU HEROISMO Y SUS VIRTUDES MAYO 27 DE 1812

All QSOs submitted must be phone contacts only and have been made after January 1970, on any band authorised for amateur radio use. Anyone interested in this award (all are numbered), must send the application to: Radio Club Boliviano, Filial 5 Cochabamba, PO Box 1900, Cochabamba, Bolivia, SA — together with the following:

1. List of contacts in the word order to the above quotation including date, time, band, and RS reports.
2. Foreign stations need not send QSLs for verification, but must have his/her log certified by the authorities of the local radio club to which he/she belongs. Bolivian applicants must submit their cards with their logs when applying.
3. In both cases, foreign and Bolivian, applicants must include 10 IRCs to cover the cost of the award and mailing.

Brief History of the Heroines of the Coronilla

In May 1812, during Bolivia's war of independence with Spain, the men of Cochabamba were situated some kilometres away from the city awaiting an enemy invasion. Instead, believing Cochabamba was left unprotected, a large enemy force preceded towards the city via a different route. There, on San Sebastion Hill — the Coronilla — the women of Cochabamba fought valiantly with whatever implements were available, against much greater odds to maintain Cochabamba, the crossroads of Bolivia, in the hands of the patriots. Although independence was not attained until 1825, the women of Cochabamba provided a turning point in the hostilities on May 27, 1812. Today a beautiful monument stands atop San Sebastian Hill forever honouring the spirit, virtues and heroism of the Heroines of the Coronilla. A lovely four-colour photograph of this monument with the above quotation appears on the CP5AA Tribute Award.

SWEDISH AWARDS

WORKED ALL SWEDEN AWARD — WASA

WASA will be issued to licenced radio amateurs for verified contacts with Swedish counties and call sign districts, made after January 1, 1988.

Swedish applicants shall be members of SSA and overseas applicants shall be members of their own country's IARU affiliated radio society.

All contacts shall have been made from the same QTH and/or within a radius of 150 km from that QTH.

Each individual contact shall be made with the same band and mode.

The same station may be contacted on several different bands.

All contacts shall be made with land-based stations.

Contacts with earth-based repeaters are not permitted.

Separate diplomas will be issued for HF, 144 MHz, 432 MHz, 1296 MHz and satellites.

For HF, 1.8, 3.5, 7, 10, 14, 18, 21, 24 and 28 MHz are counted as separate bands.

Within every group, separate diplomas can also be issued for the different classes.

Stickers can be gained for two-way contact on CW, Phone, SSW and RTTY.

All contacts shall be verified with QSL cards or equivalent, on which there is sufficient information to accurately determine the county/call sign district worked.

Applications shall consist of QSL cards and a list of these with the county/call sign districts in alphabetical/numerical order.

Instead of sending QSL cards, overseas applicants may get their cards checked by the Diploma Managers in their own countries, if such a person exists.

The fee for each diploma is SEK30 (US$5 or 10 IRCs).

Applications to: WASA, Diploma Manager, SSA, ┬ stmarksgatan 43. S-123 42 Farsta, Sweden.

Requirements:

WASA-HF (Applicants outside Europe) —
- Class 3, all call sign districts (0-7).
- Class 2, all counties.
- Class 1, all counties on two different bands.
- Shield, all counties on five different bands.

WASA-144 MHz
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, five different stations in each county.

WASA-432 MHz
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, three different stations in each county.

WASA-1296 MHz
- Class 1, all call sign districts.
- Shield, all counties.

WASA-Satellite
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, all counties in two modes each.

HEARD ALL SWEDEN AWARD — HASA

HASA will be issued by SSA to all shortwave listeners (SWLs) for verified reports of stations in Swedish counties and call sign districts for contacts made as from January 1, 1988.

The diploma is issued in the classes and groups corresponding to the rules for the Worked All Sweden Award (WASA).

No shields will however be issued.

SWEDISH LOCATOR AWARD — SLA

The SLA is issued by SSA to licenced radio amateurs for verified contacts made with the various locator squares in Sweden, as defined by the Maidenhead system, for contacts made as from January 1, 1988.

The diploma is also issued to SWLs on an equivalent basis.

Swedish applicants shall be members of SSA and overseas applicants shall be members of their own country's IARU affiliated radio society.

Contacts with earth-based repeaters are not permitted.

All permitted amateur radio bands may be used.

Requirements:

Basic diploma	25 squares
Sticker	35 squares.
Sticker	45 squares.
Sticker	55 squares.
Sticker	60 squares.
Sticker	all squares.

Endorsement can be obtained for individual bands and modes.

QSL cards shall have been received but do not need to be sent. Applications shall be made by means of a GCR list, verified by the applicant's national QSL manager.

The fee for the basic diploma is SEK30, US$5 or 10 IRCs, and SEK5, US$1 or 2 IRCs for each separate sticker application.

Applications to: WASA, Diploma Manager, SSA, ┬ stmarksgatan 43. S-123 42 Farsta, Sweden.

FIELD AWARD

The Swedish Amateur Radio Society will issue the Field Award diploma to licenced radio amateurs and shortwave listeners for verified contacts with *fields*, as defined by the locator system adopted as from January 1, 1985, (Maidenhead Locator). Contacts on or later than this date are valid for the diploma.

The Field Award is issued in four classes:

BRONZE (basic diploma)	100 fields verified
SILVER (sticker)	200 fields verified
GOLD sticker	300 fields verified
PLATINUM (sticker)	all 324 fields verified

All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth.

Contacts shall be verified by QSL cards or their equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term "position" refers to latitude and longitude or to a place name.

If there is any uncertainty about a field, SSA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent for checking.

The application shall be made on a GCR list, containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national diploma manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, 10 IRCs or US$4.

Applications to: Field Award Manager, SSA, ┬ stmarksgatan 43. S-123 42 Farsta, Sweden.

WORLD ATLAS

A world atlas, showing the new locator grid, has been produced by SM5AGM, which can normally be purchased from every National Amateur Radio Society.

The atlas can also be ordered from SSA by sending a SAE and six IRCs.

MOBILEN

The Mobilen award is issued by SSA to licence radio amateurs who have activated squares, as defined by the Maidenhead system, whilst mobile in Sweden.

Contacts made as from January 1, 1988 are counted.

In order for a square to be considered as activated, at least 10 other stations must have been contacted from that square within a period of 24 hours.

Basic diploma ..... 25 activated squares.

After this, stickers are issued for each fifth square up to 60. After this, individual stickers are issued for every new square.

Application shall be made by means of a verified extract from the station log book.

Applications to: MOBILEN Diploma Manager, SSA, ₸stmarksgatan 43. S-123 42 Farsta, Sweden.

SSA ACTIVITY DIPLOMA

SSA issues the *Activity Diploma* (A + year) for each calendar year in order to stimulate the activity of Society members.

Each year's activities are determined by SSA's Committee by the October of the previous year and are published in the QTC Diploma Column by the preceding December, at the latest.

The Diploma costs SEK 10. The fee is sent without deduction to the WL fund (for disabled radio amateurs).

The application, in the form of a verified extract from the station log book, shall arrive at the SSA office by the last day of February in the following year.

THE CITY OF WAGGA WAGGA AWARD

As late 1986 to late 1987 is the 40th anniversary of Wagga Wagga becoming a city, the award is appropriately called the *City of Wagga Wagga* Award. Wagga Wagga is situated halfway between Sydney and Melbourne, by the banks of the Murrumbidgee River, on the Sturt Highway, in the Riverina Region of New South Wales. Wagga Wagga was discovered in December 1829 by Captain Charles Sturt. Wagga is an aboriginal term for crow, thus Wagga Wagga is the plural for many crows. The city is 185 metres above sea level and is rural in its setting.

This award certificate and its upgrades of silver and gold is presented by the Wagga Amateur Radio Club (WARC). The award is open to all amateurs and shortwave listeners throughout the world on 80 metres. To become eligible for the award, each participating station will have made contact with club station, VK2WG, (two points) and eight other club member stations (one point), making a total of 10 points. A station previously made contact with can be worked again after seven days for an extra point. Shortwave listeners and amateur stations need simply prepare a log extract.

Applications go to: The Awards Manager WARC, Barry Gilmour VK2MUZ, 58 Tobruk Street, Wagga Wagga, NSW. 2650.

The award meeting night will be Tuesday evenings at 1030 UTC, on 80 metres, 3.605 MHz ± QRM.

BASIC AWARD

Two points for VK2WG.

One point for contact with club member.

Ten points for award — log extract and $3 cost of award.

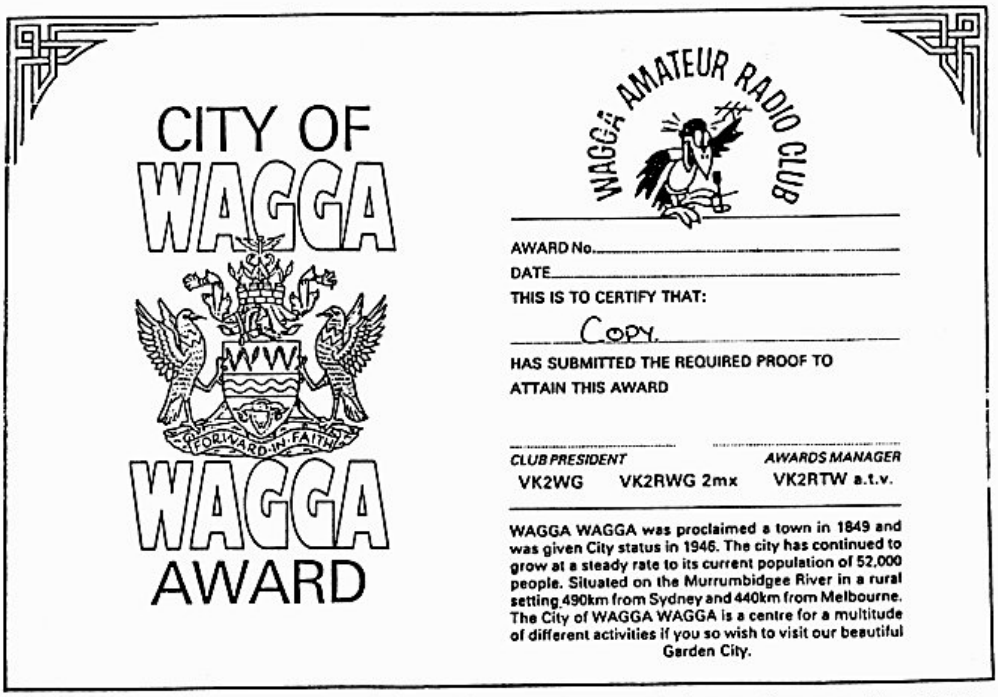
VK2WG can only be worked once for basic award.

SILVER UPGRADE

An additional 40 points for silver upgrade to the City of Wagga Wagga Award is required. The basic award must have been worked, applied for and received. For the silver upgrade there should be 24 hours between contacts with any WARC station who, on request, will give signal report and time of contact. No cost.

GOLD UPGRADE

The City of Wagga Wagga award and silver upgrade must have been applied for and received.



An additional 100 points are required for the gold upgrade. A holder of the silver upgrade is now worth one point towards the basic silver and gold awards, as from February 17, 1987.

A holder of the gold upgrade is now worth two points towards the basic silver and gold awards and, like club member stations, can be worked every 24 hours.

When applying for the upgrade, a station who has been worked as a silver or gold certificate holder and is not a WARC member, the certificate number must accompany the application for that point or points.

VK2WG can now be worked each Tuesday evening for a point towards any upgrade except the basic award. Cost of the gold upgrade is $1.

This is an honorary system for these upgrades.

ar

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

An Effective High-Pass Filter

EMC standards have to cover three different ways by which unwanted signals enter the television set affecting the performance.

1 Signals entering via the antenna and feedline.
2 Signals entering via attached cables (to VCR, etc).
3 Signals entering via the chassis due to lack of shielding, earth bonding and selectivity (test cell or Jacky test).

High-pass filters can only improve the immunity against unwanted signals, which would otherwise enter via the antenna or feeder (case No 1). How effective a high-pass filter is depends not only on its design (filter sections, shielding), but also very much on the way it is attached to the television set. The ARRL, the RSGB (Pet Hawker G3VA), and DARC (DL1BU), agree with this writer's finding that, by far, the best place for a high-pass filter is as close as possible to the tuner, soldering the filter case directly to the tuner case (no leads in between!).

In order to know how good a high-pass filter is required, we must first check the frequencies of unwanted radiation which affect the television set. This can be done with a Grid-Dip-Oscillator (GDO). A GDO with one watt DC input power would have about 0.3 watt of RF output power at the fundamental frequency and less at harmonics. The most critical television channel is Channel 2 (63-70 MHz) if one transmits on the 21 MHz amateur band. Other television channels and VHF or UHF transmission present similar, but usually not as severe problems, with the exception of six and two metre operation and adjacent television channels. A fairly typical colour television set (10 years old) showed the following susceptibility for Channel 2 and GDO transmission:

21.100 MHz x 3 = 63.300 MHz, low RFI Channel 2 from third harmonic.
16.400 MHz x 2 32.800 MHz, low RFI TV IF second harmonic.
12.810 - 13.430 MHz x 5 low RFI Channel 2, fifth harmonic 67.150 MHz.
12.810 - 13.430 MHz x 3 low RFI TV IF third harmonic 40.290 MHz.
21.280 MHz x 3 = 63.840 MHz, strong RFI Channel 2 third harmonic.
21.570 - 22.930 MHz x 3 = 64.710 - 68.780 MHz, strong RFI, third harmonic Channel 2.
33.140 MHz strong RFI TV IF on all channels. IF shielding? ? ?

The GDO coil was held close to the picture tube centre for these tests. Other positions around the television cabinet gave similar results, demonstrating the degree of RF pick-up by the chassis (compare the EMC Report in the Jack Test). The high-pass filter cannot help against RF entry via this chassis path (case No 3). But we know now where the filter cut-off frequency has to be since the GDO frequencies were checked with a frequency counter. We can see that the high-pass filter should have high attenuation from about 40 MHz and below, to cover the television IF. It is interesting to see that some frequency sections are far less affected, especially near the low frequency end of the 21 MHz band. One could take note of the listed frequencies and avoid these for transmitter operation, especially at the high frequency end of the band.

The same exercise could be carried out for the other television channels and amateur radio bands, to reduce the danger of affecting the neighbour's television reception. With the GDO at 33.140 to 33.800 MHz, the colour disappeared on all television channels due to television IF breakthough.

THE FILTER

The filter to be described is a close copy of a high-pass filter developed by the *Telefunken* company (DL) and made available to customers who have susceptibility problems with their Telefunken television sets. The response curve achieved is nearly identical to that of the original filter. The circuit shows the layout size of the printed board. Ceramic MPO capacitors are used. The filter is completely shielded. The cut-off frequency can be moved to 60 MHz by spreading the nine-turn coils, to obtain even more attenuation of the lower frequencies (31-37 MHz TV IF). The capacitor leads must be kept as short as possible to reduce the response peaks at the pass frequencies.

Tests showed that even such a filter could not help, when the filter was plugged into the television antenna between feeder and television set. The 470 pF safety capacitors and the coaxial cable between the antenna terminal and the tuner picked up RF, bypassing the filter. Considerable improvement was only achieved after the filter was directly soldered to the tuner shielding can at both ends of the filter can. The internal coaxial feeder cable was now connected to the filter input point. Only two centimetres of coaxial cable connect the filter output to the tuner input terminal. High-pass filters with cut-off frequencies near 30 MHz do not help as they permit signal breakthrough to the television IF stages via the mixer. The PC board used had five millimetre wide strips of copper along both sides and 5 x 5 millimetre copper squares in three rows between the strips. The back of the board was copper covered and soldered to the upper edge strips. These, in turn, were soldered to small PC board pieces forming an enclosed box for the filter.

This filter, so installed, allowed for the first time at least some 21 MHz operation with a FT-707 transmitter, which has over 60 dB attenuation of its third harmonic. In addition, a low-pass filter was installed at the transmitter, adding a further 60 dB of harmonic attenuation. Running the transmitter

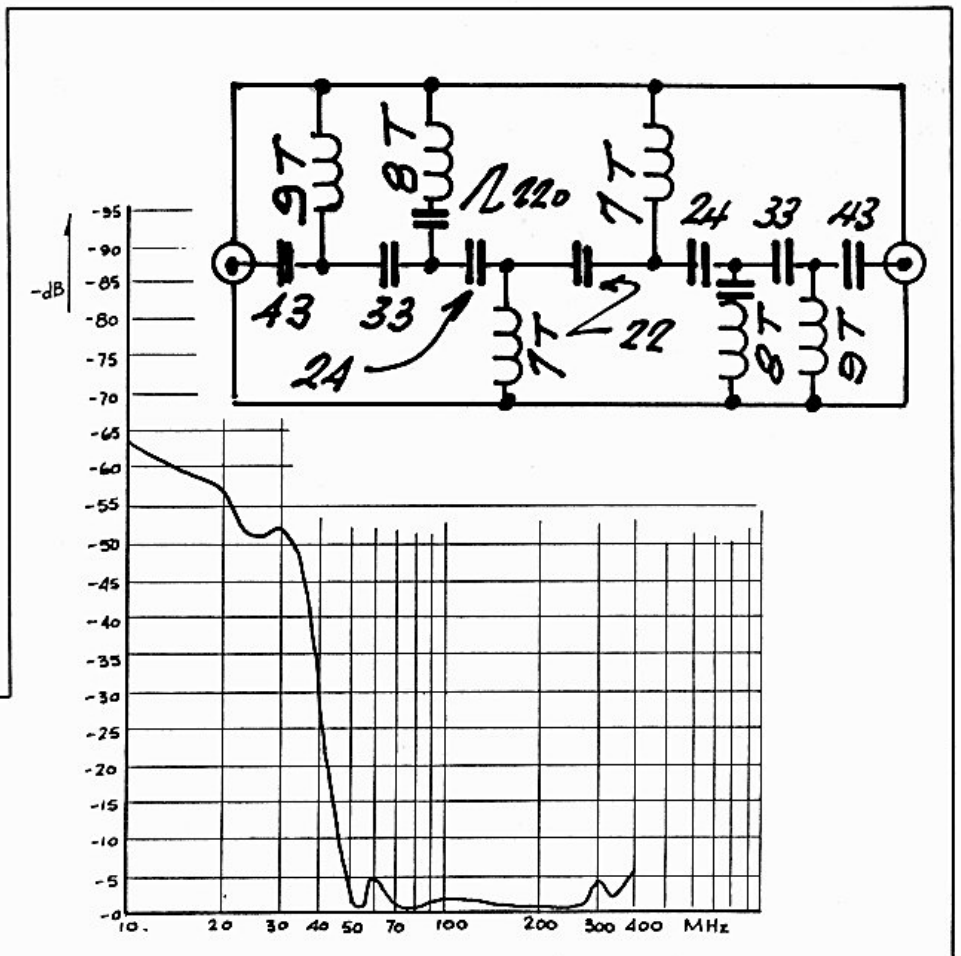


Figure 1: Copy of the *Telefunken* High-Pass Filter.
Coils:9 turns 10 millimetre OD, on 8 millimetre ∅ drill
8 turns 8 millimetre OD, on 6.3 millimetre ∅ drill
7 turns 7.4 millimetre OD, on 5.5 millimetre ∅ drill
Wire:0.5 millimetre diameter.
Capacitors in pF.
Circuit Board Layout 100 percent.

into a dummy load (Heath Cantenna) with 100 watts output resulted in no RFI with the television set standing next to the transceiver. This showed that the transmitter and filter were sufficiently well shielded.

Any RFI observed was now picked up by the television chassis only. Ferrite rings around the mains cable (three-core, with earth contact) made no difference, showing again that the chassis was the remaining problem (see EMC Report on improvised Jacky test). The television antenna stands 10 metres below and eight metres to one side of the three-element beam. And the televisions stands 14 metres below and eight-metres to one side of the beam. Pointing the beam side-on to the television allows running full power with an amplifier without affecting even this television set. Without the filter the signal picked up from the beam by the television feeder (and antenna) was so strong, that no 21 MHz operation was possible without affecting the television picture.

ar

MORSEWORD 10

Compiled by Audrey Ryan

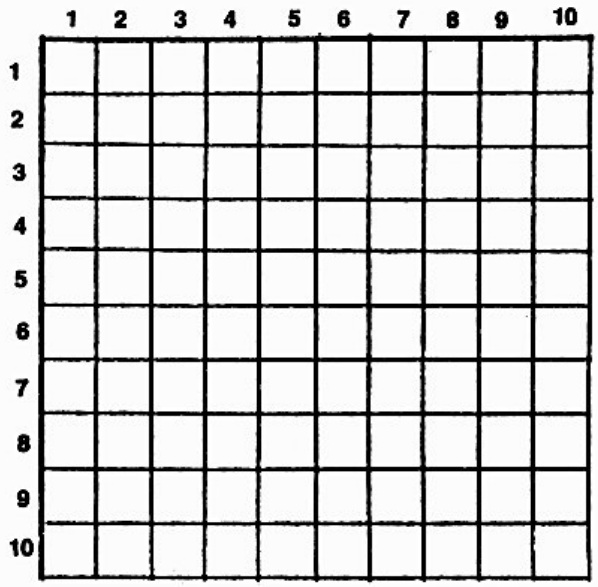
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1 Begin to grow
2 a dog
3 Employer
4 Unable to hear
5 Edges of garments
6 .... Turner (actress)
7 Impulse
8 Chew
9 Cut
10 Girls name

DOWN

1 Narrate
2 Situated
3 Adapts well
4 Sieve
5 Shakespearean king
6 Flower
7 Express contempt
8 Prickly seed case
9 Vehicle
10 Male deer



Solution page 54.

USER TRAINING MANUAL

The *IPS User Training Manual* is a practical guide for all users of IPS services, and a general reference manual on HF communications.

This manual consists of three sections:

SECTION 1
— The ionosphere and its formation
— Reflection and absorption of radio waves
— Ionospheric variations
— Mapping and predicting the ionosphere

SECTION 2
— Oblique propagation of radio waves
— IPS predictions and formats

SECTION 3
— The Sun-Earth environment
— The main types of solar activity
— The terrestrial effects of solar activity
— The disturbance warning services provided by IPS

Copies of the User Training Manual may be obtained by writing to: The Assistant Secretary, IPS Radio and Space Services, PO Box 702, Darlinghurst, NSW. 2010.

Cost of the manual is:
$A12 including postage within Australia
$A15 including surface postage overseas
$A20 including airmail postage overseas

❖ ❖ ❖

TOTAL COMMAND OF THE AIRWAVES

Sports car enthusiasts feel it when they get behind the wheel of a Porsche 922; pilots feel it when they climb into the cockpit of a Lear Jet; now radio amateurs can feel it too — that feeling of total control.

Icom's newest all-mode HF transceiver, the IC-761, is designed for the HF operator who wants more than just a radio. Behind the controls of the IC-761, you are in total command of the air-waves.

It is not just that you have almost every conceivable control feature at your fingertips, or that the IC-761 is a true all-mode transceiver (SSB, CW, RTTY, AM, FM) or that the IC-761 responds predictably to every parameter change, or that inside the box is some of the most superbly designed, sophisticated, state-of-the-art circuitry ever seen in an amateur transceiver. It is more than that. It is much like sitting behind the microphone at the Voice of America or Radio Australia . . . when you talk, it seems like everyone on the band sits up and listens.

The Icom IC-761 is designed for total operator control. It is not just a radio, but a complete shack in the one package: HF amateur band transceiver, automatic antenna tuner, electronic CW keyer, general coverage communications receiver and 100 percent duty cycle power supply — all with full computer control capability and provision for connection of an external manual or automatic linear amplifier, external automatic antenna tuner, RTTY or AFSK terminal unit, slow scan television unit, etc. To power accessories 12 volts DC is available from a rear panel jack.

Inside the IC-761 are the results of Icom sponsorship of many amateur radio DXpeditions and the feedback received from the operators who have used Icom transceivers in some of the harshest locations on Earth. Major advances in circuit design that have produced increased dynamic range for better reception, and higher quality final amplifier circuits for maximum reliability and purity of signal output.

Icom involvement in Arctic and Antarctic expeditions has led to the development, for the IC-761, of a high stability crystal unit incorporating a built-in temperature compensating oven heater providing frequency stability of better than 100 Hz over a temperature range from -10 to +60 degrees Celsius. A full featured base station equally at home in the recreation room at Mawson Base or a station in the Simpson Desert!

For the DXer or contester, the IC-761 includes a low distortion speech compressor with full metering, long and short duration variable pulse level noise blanking, front-panel controlled VOX operation, receive and transmit incremental tuning, an ultra-deep (30 dB) notch filter to eliminate annoying carriers, true IF monitoring, 20 dB preamplification with minimal degradation of signal quality, switchable AGC, passband tuning, IF shift and switchable filtering.

The filter section selects different combinations of the second and third IF receive filters: FL80 and FL32A 9 MHz filters; FL44A and FL52A 455 kHz filters. Optional filters may also be added. A front-panel switch selects between two filter systems for SSB, CW, RTTY and AM operation. Internal preset switches select 2.4 or 2.6 kHz SSB filters, 2.4 kHz or 500 Hz CW/RTTY filters, 500 Hz or 250 Hz CW-N and RTTY-N filters, and 6 or 2.6 kHz AM filters. Change the combinations to suit your preference.

Add the optional SP-20 external speaker and a further four audio network filters become available to totally tailor received signals.

If your interests wander now and then to signals outside the amateur bands, you will appreciate the ultra-wide coverage of the IC-761 receiver circuit. Quadruple conversion (except FM) with high-side IF up-conversion under CPU control provide receive coverage from a very low 100 kHz to 30 MHz. Icom's unique Direct Feed Mixer (DFM) feeds the incoming signal directly to an Icom-developed high level first mixer producing superb spurious signal rejection, higher receive sensitivity and wider dynamic range, on and off the amateur bands.

In fact, the dynamic range of the IC-761 is nothing less than 105 dB. And, at 0.5 μV sensitivity (1.6-30 MHz, SSB/CW/RTTY) with the built-in preamplifier engaged, the IC-761 still produces a dynamic range better than 100 dB!

To store all those stations you find using the many scanning mode variations available, the IC-761 is provided with 32 full function memories storing frequency, mode and split. Memory 1 and 2 set the limits for programmed scanning between upper and lower frequency limits. Mode-S provides mode-selective scanning. Memory contents are selected by a rotary switch and displayed at the touch of a button. All backed up by lithium cells with a 10 year life span.

Add to this the flexibility of instant QSY via the centrally-located soft-touch keyboard frequency controller and you get some idea of the features you will find on the Icom IC-761.

Total command of the airwaves does not come cheap, but you will be pleasantly surprised by the price of the Icom IC-761.

See your nearest authorised Icom dealer for a demonstration of the IC-761 and feel the power of total command!

❖ ❖ ❖

MARVELLOUS MODULAR MULTI—BAND MOBILE

Icom's new IC-900A series transceiver system is so logical, you must be left asking yourself. "Why didn't someone think of it before?"

Developing the suggestions of radio amateurs around the world, Icom has taken the latest in optical fibre technology and state-of-the-art circuitry and produced the first truly modular multi-band amateur radio transceiver.

The IC-900A is customised amateur band communications at its best:

- Mix and match band modules between 28 MHz and 1.2 GHz to suit your operating needs;
- Program your own frequency stepping rates for each module;
- Store your favourite operating frequencies on each band in each module;
- Monitor selected modules individually or simultaneously.

And the benefits of modular design do not end here! Because space is at a premium, in the interior of modern motor vehicles, the IC-900A remote control module, containing all the normal transceiver front-panel features, is just 150, 50 and 25 mm (WHD). Perfectly dimensioned for console installation and, weighing a mere 200 grams, not likely to stress delicate fascia panels.

As theft from motor vehicles is a real and everyday concern for the radio amateur, the sophisticated technology of the IC-900A has been removed from public view, tucked away in two slimline interface modules which, because they require no user intervention, can be securely mounted out of sight, making theft far more difficult.

Interface Unit-A caters for all external connections like microphone, external SP-8 speaker, standard OPC-095 thin power cable and the optical fibre link to the second interface unit.

This allows the remote control module to be mounted where you can easily see the display and comfortably operate the controls, while the Interface Unit-A can be installed closer to the operating position for easy microphone access.

Interface Unit-B can be even more securely positioned behind the rear seats or in the boot of the car, along with the separate band modules, to make theft even less attractive. Interface Unit-B contains the common power, preamplification, frequency, data and control circuitry for the individual band modules.

The individual band modules, up to six of them, are located with Interface Unit-B, secure and well-hidden from public gaze, where connections can be kept short to ensure maximum efficiency.

Each band module is parallel-linked to the second interface unit and contains its own frequency selection circuitry, memory section, power amplifier and antenna connector.

The UX-19A band unit covers the entire 10 metre amateur band. The UX-59A band unit covers the six-metre band from 50 to 54 MHz. Both feature selectable power output at 10 watts high, one watt low, with tuning steps of 5, 10, 15,

20 or 25 kHz selectable, and each has 10 memory channels.

The UX-49A 70 centimetre unit covers 430-440 MHz with selectable power output of 25 watts high, five watts low, selectable frequency stepping of 5 to 25 kHz in 5 kHz steps and 10 memory channels.

The UX-129A 1.2 GHz band unit covers 1240-1300 MHz with selectable power output of 10 watts high and one watt low, frequency stepping in 10 or 20 kHz steps, and 10 memory channels.

As each band unit is optional, the IC-900A modular system means you pay only for the bands you need, but retain the flexibility to upgrade as your interests or needs change.

With all five band units on board, the IC-900A provides full-featured FM operation on all amateur bands from 28 MHz to 1.2 GHz with a total of 50 memory channels. Full duplex capability means you can transmit and receive on more than one band at one time. The dual frequency display of the IC-900A remote control unit shows the status of any two band modules simultaneously for maximum control.

The IC-900A's advanced modular technology and sophisticated theft-deterrent design does not mean that you miss any of the traditional features that make Icom transceivers so popular.

Advanced scanning facilities provide programmed scanning between user-defined band edges of each band unit, or automatic scanning of the 10 memory channels in each band unit. temporarily unwanted memory channels can be locked out at the press of a button. Your favourite operating frequency on each band can be installed into the call channel memory for instant, one-touch access.

To make the initial set-up of the IC-900A a simple operation, Icom has provided *Set Mode* programming to logically program tuning steps, repeater offsets, sub-audible tone frequencies and band scan limits in one continuous cycle.

Optional extras for the IC-900A modular system include the SP-10 external speaker, MB-21 remote controller mounting bracket, CF-11 cooling fan kit, IC-PS30 AC power supply for in-shack operation, HS-15 flexible mobile microphone, HS-15SB microphone switch box, UT-28 digital code squelch (DCS) unit, and UT-29 tone squelch unit.

This advanced Icom technology is available for a very affordable price. See your nearest authorised Icom dealer for a demonstration or, for dealer information, contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181.

❖ ❖ ❖

MAKE THE MOST OF 70 CENTIMETRES

Icom Australia has announced the availability of a 70 centimetre companion transceiver to the very popular IC-275A two-metre multi-mode transceiver.

The Icom IC-475A is set to become the new "bench-mark" for 70 centimetre transceivers, with many of the features that made the IC-471A one of the best selling UHF amateur transceivers ever made and all the features now gracing its two-metre companion.

The IC-475A is an SSB/CW/FM transceiver with a frequency range from 430-450 MHz with built-in 240 volts AC 100 percent duty cycle power supply and 13.8 volts DC mobile operation.

The IC-475A features the unique Icom Direct Digital Synthesiser (DDS) frequency generation circuitry, the modern successor to the now dated phase locked loop (PLL) circuit, completely replacing all PLL circuitry with an advanced, computer designed digital synthesis circuit for extremely fast (5 mS) lock-on to a selected frequency, fast switching for advanced digital modes like packet radio and AMTOR, and superb frequency stability through the mixing of DDS-generated source frequencies in an advanced double PLL system.

Inside the IC-475A is the same advanced HD64B180 ROP central microprocessor unit as is found in the IC-275A, providing 99 user-programmable memory channels to store frequency, mode, duplex direction (plus or minus) and offset and, where used, sub-audible tone data.

This advanced microprocessor also provides equally advanced remote control capability via a rear mounted RS-232C jack operating at 1200 Baud, providing computer control of frequency and mode selection and memory channel data via an appropriate interface.

Four independent scan modes provide easy and convenient monitoring of the 70 centimetre band. Programmed scan mode repeatedly scans a selected portion of the band between user-defined limits stored on memories 1 and 2. Memory scan cycles through each of the 99 memories with selectable stop-on-busy or stop-on-clear. Mode selectivity memory scan monitors only those memory channels containing the same mode information as the main display. Skip scan provides the facility to temporarily skip unwanted memory channels.

A high integrity, newly-designed liquid crystal display (LCD) with soft orange illumination provides maximum visibility even in bright sunlight. The IC-475A display unit constantly monitors the VFO in use, the selectable mode, the split or offset data, scan mode, memory channel, RIT offset, sub-audible tone (if used) and operating frequency.

However, the most important features of the Icom IC-475A are not to be found on the outside. Under the covers is a low noise, high gain, disc-type 3SK121 GaAsFET receiver RF amplifier designed for UHF applications. This is supplemented by a quadruple-conversion superheterodyne receiver design with a balanced mixer using a 2SC2026 UHF transistor with 2 GHz frequency characteristics for improved sensitivity and greater dynamic range.

Receive sensitivity is claimed to be less than 0.1 μV for 10 dB S/N (SSB/CW); selectivity is claimed at 2.3 kHz for -6 dB (SSB/CW) and 15 kHz for -6 dB (FM). Squelch sensitivity is a mere 0.14 μV (FM) and 0.56 μV (SSB). Although unstated in the specifications, the IC-475A receiver dynamic range is considered to be in excess of 105 dB.

Transmitter power is continuously adjustable from 2.5 to 25 watts from the front panel. For higher power applications, the IC-475H provides continuously adjustable power up to a very hefty 100 watts. Spurious outputs are suppressed more than 60 dB below carrier level, while carrier and unwanted sideband in SSB mode are suppressed by more than 40 dB (1000 Hz AF tone input test).

Your ventures into 430 MHz multi-mode operation does not mean that the comforts of HF are left behind. The IC-475A features IF passband tuning, deep notch filtering, noise blanking, selectable AGC, speech compression and optional enhancements like the CR-64 high-stability crystal unit, IC-AG1 waterproof masthead preamplifier, UT-34 tone squelch unit, UT-36 voice synthesiser unit, CT-15 AQS adaptor, FL-83 250 Hz narrow CW filter and IC-MB5 mobile bracket.

A rear panel AFSK jack supplies easy access for advanced mode operation and the IC-475A is equipped with a data switch to reduce PTT switching time for RTTY, packet and AMTOR to an amazing five milliseconds — another feature of the unique Icom DDX system.

Visit your nearest authorised Icom dealers and ask for a hands-on demonstration of this versatile, feature-packed unit, or contact Icom Australia Pty Ltd on (03) 529 7582 for details of your local Icom dealership.

❖ ❖ ❖

TOMORROW'S TECHNOLOGY TODAY

The future in commercial communications technology promises many new conveniences. Imagine a commercial UHF band transceiver smaller that two cigarette packets placed end to end. Imagine that this tiny transceiver could store and operate on up to 16 different channels. That each channel could be numbered non-sequentially from one to 99 according to preference. That this transceiver would know when there is no signal present and automatically shut down unnecessary circuitry to conserve battery power. That each communications channel could have a separate and distinct selective calling code to filter unwanted traffic. That all 16 channels could be scanned at the touch of a button. That this tiny package could transmit a hefty five watts of output power. Imagine that this transceiver could be programmed by a knowledgeable technician, then sent out into the field as a portable storage database, loaded with the information required to program hundreds of other similar micro-transceivers with just one simple connection.

Forget your imagination, the future is here now.

The IC-U16, from Icom Australia, is turning commercial communications upside down.

The Icom IC-U16, approved by the Federal Department of Transport and Communications for use on the UHF allocations between 450 and 490 MHz, is a fully synthesised 16 channel portable transceiver with advanced keyboard entry and the unique ability to instantaneously program, or clone, other IC-U16 transceivers in the field, transferring frequency data, CTCSS selective calling data, transmit inhibit data (for receive only channels), frequency offsets (for split frequency or repeater operation) and tones (for tone calling or tone access) by the simple connection of microphone jack to microphone jack with a mono-stereo connector cord.

With the ever greater demand for UHF band allocations, frequencies do change from time to time. While some transceivers seem to strive for planned obsolescence, locking in frequencies with outdated crystals or inflexible phase locked loop (PLL) circuitry, the IC-U16 plans for the future with frequency generation circuitry that can be updated instantly and without the inconvenience of returning all units to a factory, or even to a dealer!

When your problems cannot be solved by simple radio contact, the IC-U16 comes to the

rescue with optional DTMF dialling via the front panel keyboard to access 'phone-patch' facilities through a base station or repeater unit. The CTCSS selective calling can be installed with or without the DTMF facility.

With its rugged, all-metal chassis with stainless steel battery slide rails and a reinforced, diecast aluminium back, as well as moisture and dust resistant seals, the IC-U16 is made to take the roughest treatment. We do not actually recommend such treatment, but one careless owner of an IC-M8, similar in construction to the IC-U16, is reported to still be using the transceiver he accidentally dropped from the eighth floor of a construction site.

When you are away from base you will appreciate the full 2.5 watts of power from the IC-U16, or you can double that output with the addition of an optional IC-CM7 battery pack. And, at those hectic times when every transmission is important and the nearest charger is kilometres away, you will really appreciate the unique power-save feature of the IC-U16, dropping receive mode power consumption from around 160 milliamps to just 30 milliamps.

The Icom IC-U16 comes complete with BP8 very long-life battery pack, BC-18 SEC approved 240 volts AC wall charger, flexible antenna, belt clip, earphone, hand-strap, external speaker plug, externals microphone plug, rain-proof cap and DC power plug. Optional accessories include the IC-HM9 speaker microphone, HS-10 headset, HS-10SA voice operated microphone unit, CM-60A desk multi-charger and BC-36 desk charger.

Call in to your nearest Icom authorised dealer or contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181, phone (03) 529 7582 or toll free on (008) 33 8915.

❖ ❖ ❖

RAAF RADIO BUTTERWORTH TO CLOSE

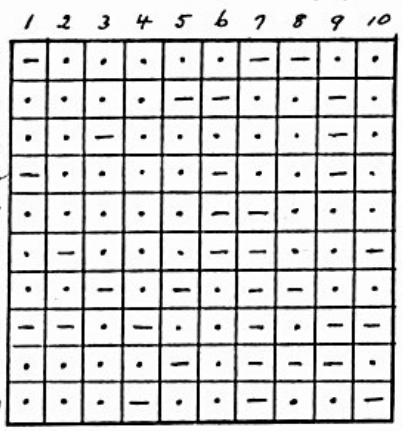
Radio station *RAAF Radio Butterworth*, otherwise known as the *Voice of the RAAF in Malaysia*, is to close after operating for the past 27 years, due to the RAAF winding down operations in Malaysia. The last broadcast will be on New Year's Eve.

There was a reunion/wake held in Butterworth over November 14-22, and all former volunteers were invited. A magazine of the highlights of this service will be available. Contact Neville Krogh, RAAF Radio Butterworth, Air Base, Butterworth, 12990, Malaysia, for further details.

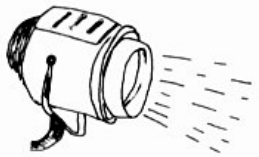
Radio Butterworth operated on 1.445 MHz, with one kilowatt, and mainly relayed to Radio Australia and Radio Malaysia, with some local content

MORSEWORD 10 SOLUTION

Across: 1 bud 2 setter 3 user 4 deaf 5 hems 6 Lana 7 urge 8 gnaw 0 sawn 10 Vera
Down: 1 tell 2 sited 3 fits 4 sift 5 Lear 6 rose 7 boo 8 bur 9 jeep 10 hart



Robin Harwood VK7RH
52 Connaught Crescent, West
Launceston, Tas. 7250



Spotlight on SWLing

Well, another year has passed and there have been several interesting developments on shortwave over the past year. There has been an increasing trend to co-operative endeavours between the various international broadcasting organisations, instead of competition and hostility. In April, NHK, the Japanese national service began broadcasting on a permanent basis from the Radio Canada International site, in Sackville, New Brunswick. From October 1986, they began a test period from the RCI site and were encouraged with the response from the North American west coast, which was a rather gray area as far as propagation was concerned. Now NHK are broadcasting up to four hours a day, via Sackville, in English and Japanese.

Next year, Radio Canada International are scheduled to begin broadcasting via the NHK transmitters in Yamata, Japan. This follows amendments in Japanese legislation to allow this as there was a law on the books that prevented broadcasters from other nations broadcasting from Japanese soil. Some readers may remember that the US Armed Forces' Network has been operational on shortwave for many years, but this goes back to the US Occupation after World War II and the Korean War, prior to Japan regaining her sovereignty in 1952.

The use of the Japanese site should significantly improve the signal from RCI within this region. Many older listeners may remember hearing Radio Canada's Pacific Service on the 49 metre band around the evening meal time. Many Canadian expatriates were upset at not being able to hear RCI broadcasting to this region, although the RCI programming to Europe comes in very well in the early morning period.

By now, the other co-operative venture in sharing transmitter sites should be well and truly operational. This is between Swiss Radio International and Radio Beijing. SRI have had severe difficulty in putting signals into Australasia during the minimum Solar Cycle and, conversely the Chinese into Europe. Consequently, the arrangement will benefit both. It was only a few years ago that Radio France International (RFI), in Paris, and the Chinese had an abortive agreement that only lasted for a few weeks, however the agreement fell through.

The need for co-operation between broadcasters has been largely brought on by necessity. The construction of high powered senders in highly populated regions, especially Europe, has been opposed by environmentalist groups worried by the effects of RF radiation. In Denmark it has caused a permanent halt to the construction of a new HF site for Danish external broadcasts and has even brought the future of the Danish shortwave service into doubt. Because of this problem SRI has elected to seek a co-operative agreement with another broadcaster, rather than go through the process of looking for a new site within Switzerland and face environmental objections. SRI has also commenced using the facilities of "Africa No 1" to transmit signals into South America from Gabon.

The other interesting improvement was the reduction in jamming from Soviet sources to western broadcasts. The new, more open policy within the USSR has seen the BBC, VOA and other western broadcasters get through with clear signals. However, not all broadcasts are getting through.

The programs from Radio Liberty/Radio Free Europe, in Russian, and various Eastern European languages now get the bulk of jamming signals. Also, Kol Israel is still jammed in both Hebrew and Russian. The only VOA programming that was jammed was in Polish, but this was likely to be lifted following recent domestic reforms within Poland.

We have seen jamming continue, particularly in the Middle East, where Tehran's Arabic programming, plus some Persian external programming is jammed. The jamming is distinctive, sounding like klaxons. There is reportedly also interference to some Arabic transmissions from western countries and Syria. Transmissions from Taiwan directed to the mainland are also jammed with what sounds like "white noise."

The other development concerned the coups in the Pacific, which is very close to Australia. The first one in May caught everyone off-guard, but the media was a little more prepared the second time around. With the domestic media under tight censorship, news on what was happening within the area mainly came from shortwave via the BBC, Radio New Zealand and, especially Radio Australia.

Because of the pressing need for the BBC to provide reliable signals into the Pacific area, arrangements were hastily made for the BBC signals to be fed via the RA Shepparton site. At the time I am writing this, the BBC via Shepparton is quite good on 15.105 MHz from 2245 to 0030 UTC. I don't know the length of this temporary arrangement, but I hope that the two organisations can continue to provide a good signal into this region at that hour.

At the end of September, the BBC Hong Kong Relay came on stream. I am hearing it well in the evening hours on 7.180 MHz, when they mainly carry the BBC Asian Service. The daytime service on 15.280 MHz has been disappointing, yet it should be remembered that the signals are being beamed to Japan and North China. The BBC Far Eastern Relay has been freed to provide a longer service to many in this area.

This year also saw the demise of Lyndhurst as a transmitter site. The ABC Domestic HF Service, VLR and VLH, from Melbourne closed down after 50 years of operation on June 12. Then on September 30, Time, Signal and Standard Frequency station, VNG, was closed down, with only 24 hours notice. This service will be missed by many, who particularly utilised the 7.5 MHz signal to calibrate the 40 metre section of their transceivers. The other development was the ABC MW Networks going to 24 hour transmission, with Radio National relaying RA programming between midnight and dawn. There has also been wholesale changes in the media scene generally within Australia, that 1987, in my opinion can be categorized as the *Year of Change!*

Until next month, all the very best for Christmas and a Happy 1988, which will be our Bicentennial Year, and good listening!

—Robin VK7RH
ar

WICEN News

Paul Walton VK3PW
3 Elgin Grove, Belgrave Heights, Vic. 3160

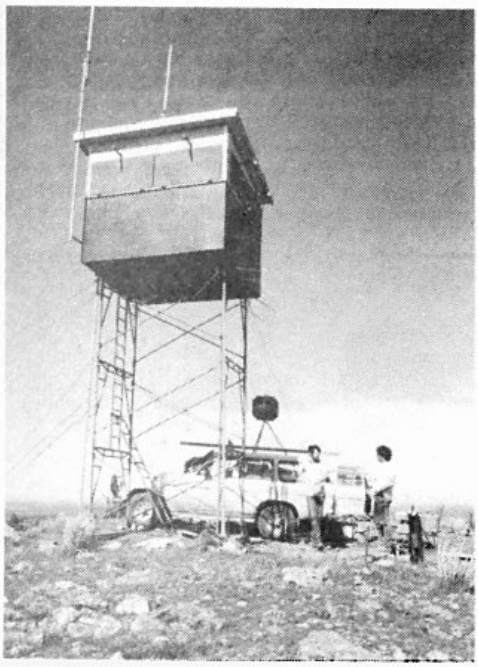
RALLYING TOGETHER AT HEATHCOTE

Heathcote, 8 am Saturday, September 19, and the quiet of the morning is broken by the sound of rally cars preparing for the day's event!

The *George Derrick Memorial Rally*, organised by the Car Club of the Royal Melbourne Institute of Technology, was to take place in the Heathcote to Pyalong area of Victoria. Over 50 drivers and their navigators were required to negotiate 20 stages of the event against the clock. The team with the least overall time for the event would be deemed the winner. With the temperature in the mid-20s, the day promised to be enjoyable for the officials and spectators, whilst dusty and fast for the competitors.

In an event of this type, safety, smooth operation and accurate up-to-date scoring are paramount to a successful rally in the eyes of the Rally Directors. To assist in these matters, WICEN has been providing a service to the larger of the rally events as they provide the basis for an excellent form of training exercise.

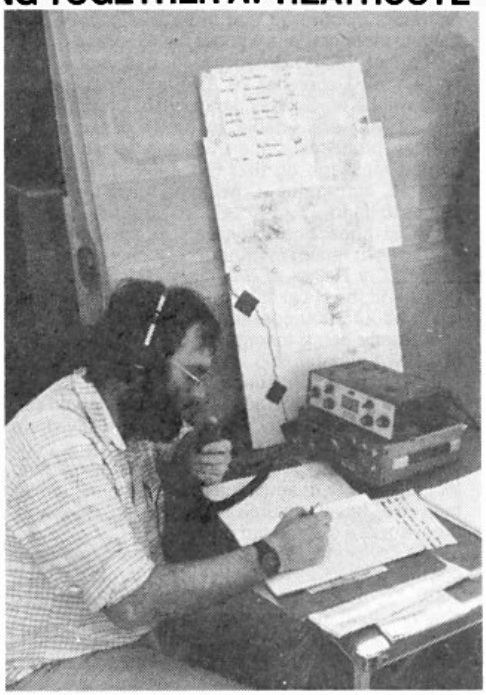
WICEN was required to cater for portable stations located at the start/finish of the stages, as well as for mobiles which would be traversing the rally trouble spots. To successfully service all these operators, the base station was to primarily operate on two-metres and 70-centimetres, through portable repeaters, VK3RWE and VK3RWP, with 80-metres reserved for those stations with no access to the repeaters.



Roo VK3YML, and Andrew VK3KIR, at the Mount Ida portable repeater site.

Some members from Region 13 arrived at Heathcote on Friday night to erect the two repeaters on nearby Mount Ida. Keys were obtained from one of the local residents to gain access to the fire tower on the summit where antennas would be secured. The tower would also prove a convenient place to sleep, but with the gusting winds tugging at the tower sleep was something that escaped most members.

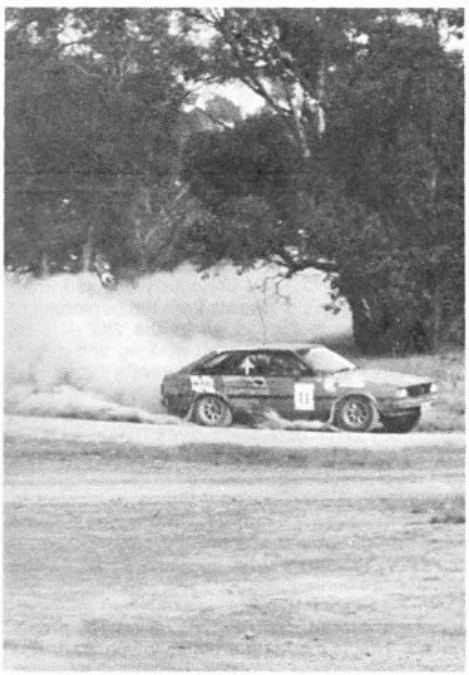
The repeaters proved their worth in covering the large area of the event. Few stations found it necessary to resort to HF to maintain their part of the network. Indeed, some operators found hand-held units sufficient to allow them to tag officials at check points and still see some of the racing action, too!



Ross VK3JZ, operating HF at Heathcote Oval Base Station.

As is usual with these events, all the preparatory planning pays dividends for the directors in ensuring the rally runs as near to expectations as possible. Despite this, accidents do occur on the track, checkpoint officials do encounter minor problems and, even non-participating vehicles can be found on competitive sections of the rally (much to the surprise of the competitors!). Without radio communications, the directors would have to cancel stages of the event, or experience large time delays in dealing with these problems. Thankfully, only minor dramas, which could be rectified with a minimum of delay, were experienced. This was achieved through the Director's ability to quickly contact his roving officials.

Rally Director, Simon Brown, looks on as Mike VK3KMJ, receives messages.



The dust flies as the cars negotiate a tight corner.

Late afternoon saw Geoff Portman and Peter Gale taking race honours in their Datsun 1600. After a short presentation, it was off to a barbeque to relive the days more memorable moments. Rally Directors, Simon Brown and Ken Cusack, thanked Roger VK3BKR, and his team of operators from Regions 2, 13, 14, 21 and 22 for providing the much relied upon network.

Throughout the day's activities, Andrew VK3KIR and Paul VK3PW, filmed video footage of the event (and spent more than 20 hours in post production time) to produce a video tape for WICEN promotional purposes. It is hoped to show amateurs the fun that can be a derived from participating in such events. These exercises are one of the better ways to increase communications skills whilst having a great time too. It also provides public awareness of amateur radio which may result in new membership!

ar

REMEMBER

When inquiring about products published in AR always mention where you read of the product.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

It does not take long for a year to go and members are advised that it will soon be time for the AGM and election of officer bearers for another year. Nominations for council will be called in February and the AGM will be held during April 1988.

The VK2 membership fee for 1988 for renewals and new members has been set as follows:

Full Member	$37.50
Associate Member	$35.50
Pensioner	$30.50
Student	$18.50
Family	$23.50

The VK2 Division, as previously advised, is to introduce a series of awards from the beginning of next year. The major one will be the VK2 — 1988 — Award, which requires the working and confirmation by log entry, of 200 different VK2s during the year. Also being introduced is a National Parks and a Shires Award. All contacts made on and after 0001 UTC, January 1, 1988, count towards the awards. During November, the Division will provide a special award as part of the Parramatta celebrations. The Divisional Office is located in the Parramatta municipality. On January 26, the Division will mount a special events station. A special QSL card will be available for exchange through the bureau.

During October, the Division received an excellent lecture from the IPS Service on HF propagation. This is the lecture series which is, or has been, given to other Division throughout the year. The lecture will be made into a video for release in 1988.

The two-metre FM Contest held in late September, had a very high level of participation. Over 100 stations were logged, including several country stations. It is planned to run a series of contest during next year promoting the various VHF and UHF modes. The rules will be tidied up to form a common set for all the local contests. Many operators discovered that there was a path from them to other stations without the aid of repeaters.

The last VK2WI Broadcast for this year will be on Sunday, December 20. The first broadcast for 1988 will be on Sunday January 10. Do not forget that, if you are unable to catch either of the Sunday broadcasts, then use the telephone recorded message on (02) 651 1489. This will be updated during the Christmas break as news comes to hand.

WICEN has been involved in several major exercises in recent months. This included the City to Surf, Car Rallies at Batemans Bay and Central Coast and the Hawkesbury Canoe Classic, resulting in about 2000 operator hours. WICEN in VK2 is currently being incorporated as a requirement of its VRA membership.

It is almost Christmas and, should you be dropping hints, but if the rest of the household can not think of anything, then contact the Division's Bookshop, at Parramatta. There may be a book you would like. If you are trying to find something for the younger or smaller members of your family, then we have several size 12 and 14 windbreakers at a discounted price.

The Divisional Packet Bulletin Board has been operating as VK2AWI on an experimental basis on 7600. From December 1, 1987, this will change to channel 4850 and later relocate to the VK2WI site to provide a greater service area. Consideration is being given to adding an 80 metre port to the bulletin board to provide country access.

The various VK2 repeater matters have been reported in this month's Beacon and Repeaters column. The Sydney ATV Group is currently rebuilding their transmitter for the repeater — VK2RTS — facility. In addition, they are looking for a new site, if possible, in the Sydney metropolitan area. Gladesville ARC have continued their Wednesday evening test video transmission. If you are a viewer, then call-in at intervals to provide a report on their coverage. They will be taking a short break during the holiday period from the live sessions and will do like the other outlets and provide highlights of the best of the year! The deferred AEM Modern Modes Symposium will be held at Amateur Radio House, on Sunday, December 6.

A reminder to members that some new titles have been added to the Division VHS video tape library.

The Divisional Council, at their October meeting, discussed some early submitted agenda items for the next Federal Convention. These have been forwarded to the Federal Office. They were, that the closing date for Federal Convention agenda items be altered to allow sufficient time to publish the agenda item in full in *Amateur Radio* to allow all members the chance to discuss and provide input on the matter. The other agenda item came from a submission prepared by Grahame VK2KZV, that the holders of combined call signs — K calls — having demonstrated their technical level by way of the theory examination be granted the mode and power level qualifications to their HF operation, currently available to them in their VHF and higher frequencies licence. These items will become agenda items for the 1988 Federal Convention.

A warm welcome is extended t the following new members who were in the October intake.

P Draxler Assoc	Macquarie Fields
D A Folkes VK2XDF	North Manly
R M Hanna VK2MDC	Mittagong
L K Ho VK2AKD	Castle Hill
J A Kentwell VK2XBR	Springwood
W A Miller VK2MWA	Eastwood
J A Pincock VK2MCT	Long Jetty
R D Smith VK2ARB	Frenchs Forest
J E Stedman Assoc	Lindfield

ar

VK3 WIA Notes

The WIA (Victorian Division) would like to express its thanks to the following for their contribution of QSL cards to the WIA QSL collection:
Jim VK3YJ, Allen VK3SM, Barry VK3XV, John VK3AJY, Mike VK3KTO, Bruce VK3SO and Andy VK3UJ.

We have avoided mentioning the number of QSLs donated to the contribution for we want to encourage all DXers to contribute, if possible, no matter what the number of QSLs, but we have to say that there have been some particularly generous contributions which have got the collection away to an excellent start.

As mentioned previously, we do encourage DXers to look through their old shoe boxes fill of QSLs collected over the years and pick out some duplicate copies of those rarer kind of prefixes and ARRL DX countries. They would be greatly appreciated. Please do not destroy any future QSL cards, but rather drop them into the WIA rooms in Brunswick Street, Fitzroy (Monday to Thursday before 3.00 pm), or leave a message for any cards to be picked up from your home.

—Contributed by Ken Matchett VK3TL, Curator

The September meeting of the Council of the WIA (Victorian Division) made several important decisions on the following items:

1988 SUBSCRIPTIONS

The Victorian Division membership subscription for 1988 will be increased by $5 for all classes of membership. The increase is $2 to cover rising costs, and $3 increase in the Federal component. The Federal increase was agreed upon at the 1987 Convention.

ZONE GRANTS

Zone grants will be paid in 1988. These grants will be at the rate of $4 per head for each full member who resides within the Zone. Grants will be paid to Zone Secretaries not later that the first week in April 1988.

Zone treasurers will provide the Victorian Divisional treasurer with a statement of receipts and expenditure and bank statements for the preceding year not later that February 28, 1988.

Failure to provide a proper record of Zone expenditure and receipts by the required date will render the Zone ineligible for a grant. No requests will be made by the Victorian Divisional treasurer for statements and the responsibility for timely forwarding will be that of the Zone.

REPEATER FUNDING

The Victorian Division will bear the cost of maintenance and service of a primary repeater network in Victoria. Zones will be required to pay for all associated costs including licence fees, site leases and power for those repeaters which do not form part of the primary service or alternatively are funded by WICEN.

Classification of repeaters will be undertaken in consultation with VTAC, WICEN and Zone representatives, and should be completed by February 1988. Zones will be able to exercise the option to retain or delete any repeater services they do not require, and which are not funded by the Victorian Divisional Council, or WICEN.

CHRISTMAS VACATION

The Victorian Divisional Office and Rooms at 412 Brunswick Street, Fitzroy, will be closed for the Christmas break from Thursday, December 17, 1987, until Monday, January 25, 1988. There will be no council meeting for the month of December.

—Contributed by Bill Trigg VK3PTW

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

On Friday, September 18, the usual monthly Divisional Council meeting did not start until 9.40 pm local time. No, we were not all running late. In fact, most of us were there at 8 pm, but we were conducting a Public Relations exercise!

As most readers know, we lease our Headquarters building from the Thebarton Corporation and we had heard along the 'grape-vine' that some of the councillors had expressed interest in our activities, and would like to find out more about what we did. We considered this to be a perfect opportunity to do some PR work and so, at the time mentioned, we welcomed Councillor Mary Linn, a young man whom we think was Mary's son, and Colin Shearing, who was the Mayor of Thebarton at the time of acquisition of the Burley Griffin Building.

Councillor David Mackellar had also hoped to be with us but, as he was not able to attend, we hope to show him around at a later date.

I think Colin Shearing was impressed with what had been done with the building as he would have seen it in its original state (as an incinerator). Mary Linn took copious notes and asked plenty of questions. She was very interested in our WICEN and other community-spirited activities. She also mentioned that they might ask us to be involved in some celebratory activities in Thebarton next year, particularly any amateurs who live in the Thebarton district. It might have made the meeting start very late that night but, all in all, we felt that it was time well spent.

Council was approached by ALARA to find out if we could house the Florence McKenzie Trophy for them. The VK3 Division had been approached but, as they may have to sub-let part of their headquarters building, did not feel that they were going to have any spare room. The VK5 Division did not see any problem in housing the trophy in the Burley Griffin Building so, on Saturday, September 26, around 3.30 pm, the trophy was duly handed over to me as Divisional President by Marilyn VK3DMS, the President of ALARA, in the Burley Griffin Building.

That weekend ALARA was meeting in Adelaide for its National Get-Together (of which you will be able to read more in the ALARA notes) and it gave us an excellent opportunity to have it brought to Adelaide from VK3 (thanks to Neil VK3KNM and his wife, Muriel). Part of the Saturday afternoon activities, after a guided tour around the City, was afternoon tea at the Burley Griffin Building and a chance for the ladies to meet, not only the VK5 Divisional Councillors, but also the Federal Awards Manager, Federal Video Tape Co-ordinator, immediate past Federal Contest Manager, and several others of whom they might have heard through AR etc.

Whilst on the subject of that weekend, I would like to thank the VK5 OMs for their great courtesy and forbearing. On the Friday, when we were listening for and talking-in many of the interstate visitors, we did take up a lot of 'repeater time' and for part of the Saturday and Sunday when we were travelling in mobile convoy we used Channel 50 as the liaison frequency, and not once did I hear a derogatory remark or a grumble. In fact, our interstate visitors were most impressed by the South Australian friendliness and hospitality.

As well as all the OMs who were involved in the weekend (mostly because they happened to be married to ALARA members) I would also like to thank Treva Slater VK5ZIS, who kindly took on the position of official photographer for the weekend, and an excellent job he did as you will see when samples of his work come to light in future issues.

There is no further news from our Bicentennial Committee, last I heard there are several members willing to form a committee, but no one wants to wear the co-ordinators hat!

Do not forget the Christmas Social on Tuesday, December 8, 8 pm at the Woodville Community Hall, 64c Woodville Road, Woodville (on the right-hand side between Port Road and the Town Hall after you cross Port Road). To date we do not have a speaker, and no one has volunteered to help with the catering, but do come along anyway and do not forget to bring your 'other half.' (YL, OM, or whatever!). Also, bring a plate of supper to augment that provided by the WIA.

Next month's column will either have a guest writer (or, if no one volunteers, will be absent!). At the time of writing I shall be 'snowed under' with preparations for a son's wedding. This was also part of the reason that I was unable to accept an invitation from the Darwin Amateur Radio Club to attend their 21st Birthday Celebrations. I hope that it was a most successful time, nonetheless, and that you will continue to be a strong and active club in the years to come.

In the meantime, I would like to wish everyone a very Happy and safe Christmas and New Year holiday period.

Official ALARA-Meet Photographer, Treva Slater VK5ZIS, took time from his duties to pose with Christine Taylor VK5ZCQ.

Snapped at the ALARA-Meet 1987, are: Publications Officer John Gardiner VK5KJG, John's wife Wendy, Sylvia Hunt, wife of Ian VK5QX, Pam Bruce and (in front) her OM, Rowland VK5OU, VK5 Federal Councillor.

JUBILEE 150 AWARDS

1410	KA5YCM
1411	NS7J
1412	YC3FHN
1413	YU3DB

ar

QRM from VK7!

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

Since this is the first information bulletin from VK7 for AR for some time. it is obvious we have some catching up to do. This has been a rather busy season for WIA members in Tasmania, and that situation seem likely to carry-over into 1988.

WICEN exercises were successfully held in the Central Highlands in September; there was the control cover for a car rally in October; then a mini-exercise in November. Still further action is on the way for January when a WICEN exercise is invited by the SES as communications for a proposed orienteering international competition, but the operation to which the most public attention will be paid is that of organising the communications for the Westcoaster (Melbourne/Hobart) Yacht Race just after Christmas. This latter exercise will, it is hoped, incorporate a Bicentenary Special Event Station to create even more interest.

Last year's Westcoaster, for which communications were also provided by the amateur fraternity, received a comprehensive report in the American magazine *73* — a proud achievement. We hope to do at least as well this time. The practice should be extremely useful for when the special 1988 Tasmanian Amateur Radio Convention is held later in the year.

Do not forget to send in your application for the Tasmania Day Award, just recently the object of a great deal of activity. Yes, we know that it is only a few days since it ended, but our Awards Manager is straining at the leash to despatch all those certificates!

Please note that two packet radio stations are up and running, one in Hobart on 147.600 MHz, call sign VK7LT. The other has been set-up by VK7ZAP, in the north of the island, also on 147.600 MHz, simplex.

Official WIA Broadcasts now emanate from the Activity Centre, 105 Newtown Road, Hobart. The Branch is in the process of either buying or building equipment for itself (at this stage, the transmissions and relays are being carried out with equipment owned by individual members) so that anyone who is willing to originate the broadcasts is not inhibited by having no access to transceivers or patching units. A roster has been organised which consists of eight operators for an 80-metre relay, eight more for 40-metre and one each for 144.100 MHz SSB, 52.100 MHz and an experimental relay on 20-metres — to be exact, on 14.140 MHz.

The set broadcast time is 9.30 am local time on Sunday mornings, but now experiments are in progress for a taped repeat (with update) on Tuesday evenings at 7.30 pm local time, just preceding the Devil Net on 3.590 MHz.

Speaking of the Devil Net reminds me that Bob VK7NBF, has recently sent out the 400th Devil Award Certificate. The lucky recipient, who also received a signed photograph of the Devil Net Organiser himself (?) was John VK3CWJ, from Mornington, Victoria. Certificate No 401, following closely behind, went to VK2KJK, from Woolgoolga, north of Coffs Harbour, New South Wales.

Repeater 2, 146.700 MHz, on Mount Wellington, Hobart, has been undergoing detailed maintenance, repairs (mainly weather-proofing external cabling), and rebuilding of the repeater equipment itself. If the results of the repeater workers' efforts match the quality and quantity of the work that they have put in, then repeater 2 should still be operating well into the 21st century!

Noel VK7EG, has for some time been publicising a scheme for assisting would-be novice amateur radio operators, firstly in the north and later it was adopted by other branches. His idea is to place information via schools, colleges, etc, that study guides on amateur radio would be made available to those who wished to begin to work for a qualification. Each applicant would be assigned a specific adviser to help sort out possible problems, assignments being made on a geographical basis.

It has already been said what a busy season is in progress, so it is no wonder we are looking for new members and Noel's scheme deserves a "fair go." When the ever-widening framework within which radio amateurs operate is considered — satellites, word-processors, packet, RTTY, even more Ultra-HF and so on — it makes our hobby an almost all pervading habit. And we need new recruits from the younger age brackets to keep abreast of such new developments.

Watch for a listeners guide to repeaters, coming soon in AR (UK version). If you want to know what GOBS, WUMS, Puckerus Sonicus, TOMS, the Nearly Man and Comets, not to mention Wallius Formerus, are, this article will put you right.

MONTH'S MEETINGS

At Penguin High School, on Tuesday, December 8, at 8 pm.

At the Activity Centre, 105 Newton Road, Hobart, on Wednesday, December 2, at 8.15 pm.

Recent talks and discussions at meetings include Cellular Communication Systems, by VK7AW, Need for Morse in order to Qualify as a Radio Amateur, by VK7ZRP, Patching Units, by VK7BJ, RTTY Mailbox, by VK7ZAP, and all about Federal Affairs, by VK7PF.

RADIO AMATEUR OLD TIMERS' CLUB

The Radio Amateur Old Timers' Club will be holding its December Get-together on Tuesday, December 8. It will again take the form of a counter lunch and rag-chew.

Attend from 12 noon at the usual location, the Waratah Hotel, Murray Street, Hobart. As this is a Christmas function, ladies will be very welcome, as will any prospective members (those who have held an amateur licence for 25 years or more).

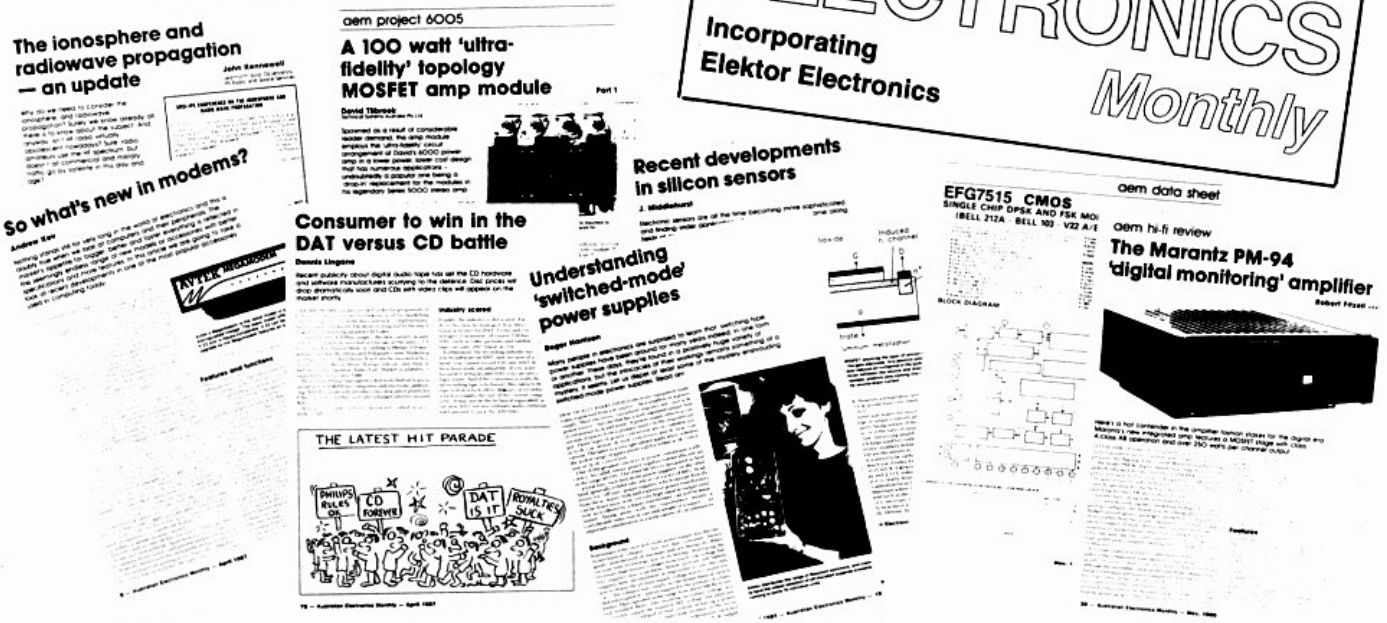
Bookings or further inquiries should be made with Joe VK7BJ, QTHR.

ar

SUBSCRIBE NOW AND SAVE OVER $20!

Buying AEM from the newsagent every month will cost you $57 for 12 issues. For a limited period, we're offering subscriptions for $36!

Just $3.00 per issue!



Australia's independent technical electronics journal, providing a balanced coverage of the fields of audio, broadcasting, pro sound, video, communications, computing, engineering and technology. Edited and published by industry identity, Roger Harrison.

FOR ONLY $36/12 ISSUES, YOU GET:

- **5 to 10 projects to build each month**
  – the best from our Australian designers and the cream from the British Elektor.
- **Monthly Project Buyers Guide**
  – each issue we detail where you can get the components featured in our projects as well as which firms are stocking kits of our projects.
- **Telephone technical enquiries**
  – yes, you can speak to the editorial team direct and have your queries answered. We don't live in an ivory tower!
- **Hi-Fi, sound and video news, reviews & features**
  – independent, professionally conducted reviews from Robert Fitzell Acoustics; features from well-known writers like Dennis Lingane and Malcolm Goldfinch.
- **Practical computing articles**
  – a whole section each month devoted to electronics enthusiasts exploring computing and computing enthusiasts exploring electronics.
- **Communications coverage**
  – news, reviews and practical features on RF techniques and radio communications, covering everything from circuit techniques to cellular radio, from satellites to amateur radio.
- **Topical technical features**
  – covering consumer electronics, topical technological and scientific fields, current issues and circuit techniques.
- **What's new in the market**
  – occasional features on new products and developments, giving topical and informative coverage of specific fields and product groups.

You'll find something to interest you every month in Australian Electronics Monthly, no matter what your special interest might be. The magazine is "sectioned" into categories for easy reading and easy reference, each section headed by its own news column.

If you've found AEM hard to get in your newsagent, DON'T DELAY, SUBSCRIBE TODAY!

If you work in electronics, communications, computing or servicing, a subscription to Australian Electronics Monthly could be tax deductible.

COUPON

Yes! Put me down for a subscription to Australian Electronics Monthly at **$36**— for 12 issues. I am paying by (please circle payment method):

(Offer closes 31 December 1987)

Cheque: (No:) _____

Money Order (No:) _____

(Cheques or Money Orders should be made out to "Australian Electronics Monthly")

☐ Bankcard ☐ Visa ☐ Mastercard ☐ Amex

Card No:_____ Expiry:_____

Signature:_____

(Note: unsigned credit card orders cannot be accepted)

Name:_____

Address:_____

_____ Postcode_____

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!

FUTURE OF AMATEUR RADIO

Further to the letter of Tony Lewis VK2EHL, in the October issue, pertinent to the future of amateur radio. I think he makes some very profound points.

I recently gave a talk on amateur radio to the members of one of my local clubs, whose professions range from retired bank managers to mining engineers.

From the questions asked of me at its conclusion, it was apparent that they had expected me to elucidate on a hobby, practiced in a broom cupboard under the stairs, lit by a 15 watt globe, which had remained dormant since Biggles days, when to make a contact with an overseas amateur, was written up by an excited editor of *Modern Boy* or *News of the World.*

That we were permitted to speak with Russia, Bulgaria, etc, etc astounded them ... which relates to the points made by Tony, that the vast majority of the public have no conception of how sophisticated this hobby has become, and of the vast number of men and women, throughout the world, from all walks of life, who are involved. Perhaps, to some degree we have ourselves to blame when we continue to describe our station as a shack, our equipment as a rig and ourselves as hams — shades of 1930 and Tony Hancock!

Let us get more involved with the public ... not just when a three line article on page seven of the press tells its readers that a "Ham Operator picked up a call for help from a lost Butterfly Collector in the Amazon Jungle!

How about a photograph of an amateur station on the front of the Telephone Book in all States ... surely we have a little clout in that area. Or can we get a 10 minute segment on the local State Affair Television Station?

Are we represented at the Royal Show annually in each State? I believe it would be a magnet for the young people whom we should be encouraging. At the recent Adelaide Show, the Army had a Leopard Tank, and the children were over it like swarms of bees, and lining up for brochures.

What about Expo in Brisbane in 88? This will be one of the largest ever staged in Australia with representation from many countries.

Individual amateurs could approach their community library to put in a static display. Our own library is always looking for an exhibit to complement books on the particular subject. I recently displayed some home-brew ship models and maritime bits and pieces I had collected as a ship's radio officer, which created considerable interest. The mind "boggles" with many creative ideas to focus public attention on our hobby, and, if we are to have a future, we cannot expect our "Head Office" to wave the magic wand. Our members have got to get off their seats to ensure we are still around in the year 2000.

Bob Clifton VK5QJ,
4 West Terrace,
Beaumont, SA. 5066.
ar

* * *

I AM PUZZLED!

For sometime I have been reading letters to the editors of AR, and other magazines, offering reasons why amateurs will leave, or will not join the WIA — really, I am puzzled.

Firstly, if the members fall too much, fees must rise to very high levels and lead to the possibility of the WIA ceasing to exist.

Please reflect on this situation!

Our band allocations under constant threat, and mainly preserved because there is a WIA and similar organisations in other countries, would be threatened with extinction, then if we want to still use our hobby, perhaps some CB channels will be available.

Reference is made to the advantages of city members compared to country members, presented by the WIA. Will someone please tell me — what are they?

If there is something we are missing out on, I am sure our East Gippsland Zone meetings will press for equality.

I cannot add to the reasons so often enumerated by the Editor and others, for being a member of the WIA, but remind everyone in case some do not know, the WIA is **not** a salaried group paid to tuck us into bed, etc, rather it consists of a large number of loyal unpaid volunteers who happen to value their licences, and who work hard and long hours keeping the service operating to the best of their ability.

Keith Scott VK3SS,
34 Henry Street,
Maffra, Vic. 3860.
ar

* * *

GENTLEMENS' AGREEMENT

I am one of the many amateurs who daily try to provide a service to other amateurs in the form of the *Travellers' Net.* This net takes place daily and has been doing so for about 20 years. Judging by the letters received and the complimentary remarks made on air, it is a service that is much appreciated, and — without going into details — it should be fairly obvious that quite an amount of emergency traffic has been handled from time to time and that we frequently pass messages that could not be delivered to the particular traveller by any other means. During the past five years well over 1500 different amateurs have made use of the net.

Due to the long establishment of the net, it is quite well known nationally and internationally and appears in foreign magazines in lists of nets.

Recently, however, we have been suffering some interference from packet radio, and the operators of these stations feel that we should change our frequency. I have, in fact, been told on more than one occasion that I have no right to be using SSB on 14.106 MHz, and in view of this criticism I would like to make the following points.

1. I fully agree that no one station or net can claim any exclusive right to a particular frequency at any particular time (I would have thought that this applied equally to packet radio), but I have, until now, always found a high degree of co-operation from anyone using the frequency if they are told that a net is usually held there and is shortly due to start. If approached in a friendly fashion they readily agree to QSY.
2. The Travellers' Net is not the only SSB user in this part of the band. Most mornings, a number of South American operators can be heard; there are many French speaking stations working there of an afternoon, and at any time various SSB QSOs can frequently be heard. Why, therefore, should the Travellers' Net be singled out for criticism?
3. Our continued use of this frequency is based on the IARU Band Plan for Region 3 as published in *Amateur Radio,* February 1986, page 22. From this it would appear that, under the Gentlemens' Agreement, the packet radio stations should not be working in this part of the band.
4. Packet radio operators have told me that they have established themselves on the lower end of the 20 metre phone band and they complain of interference from the Travellers' Net. I feel that this reasoning is the wrong way around. They have forced their way onto these frequencies without any international agreement or discussion and appear to want to force all other operators off *with a consequent de facto unilateral reduction in the 20 metre phone band.* They cause interference to us and the interference to them from SSB should have been taken into account when they decided on their frequencies.
5. To change our frequency, despite it being so long established and so well-known, could, of course, be done if proper notice were given, but if we change (say) to 14.115 MHz, how do we know that next week, next month, or next year we will not be told that there is no longer sufficient room for increasing packet radio operation in the segment at present being used and that they intend taking over a further 10 kHz or so of the phone band?
6. If the use of packet radio on these frequencies had been discussed and agreed on generally, I would have immediately abided by whatever decision was made. If I had been approached in a reasonable manner beforehand, I would have given any request made sympathetic consideration, provided it were in accordance with the band plan. But, the only direct communication I have had, apart from some criticism on air, was a telephone call some considerable time ago saying that there was insufficient room for packet radio below 14.100. They were going to start up in the next 10 kHz and I had better move or they would "blast me off the air". The same caller told me there was no way in which our transmissions would interfere with them! This reminds me of the anarchic start of CB with the resultant loss of 27 MHz to amateur radio.
7. I agree that new modes come about and have a right to band space, but I do earnestly request those behind such new modes to sort things out in a friendly discussion and not to force their way in without consideration for anyone else.
8. The American use of these frequencies for packet radio is readily understood. They do not have phone facilities there, so their phone band is not being reduced. This, however, is not an argument for the rest of the world to adopt the American band plan.
9. I can understand the use of unattended stations in a receive mode only, but if unattended transmissions are permitted, how can they listen before transmitting to make sure the frequency is free and how on earth can anyone demand silence in the event of a distress call being received?

I am a fairly old man. I was enjoying amateur radio and felt that I could still be of service to others. I thought I had outlived the time of petty squabbles and arguments, and could lead a peaceful life mixing with a fraternity of reasonable, friendly and considerate people. I hope I was mistaken, but I feel that, if for the sake of peace and quiet, I change frequency in advance of any changes to the band plan by the bodies concerned I am giving an open invitation to any group of people to ignore the gentlemens' agreements to the detriment of the majority. The same invitations would of course be given by a meek alteration of the band plan to accommodate a de facto situation. Before changes are made, it should be thrown open for general discussion to see whether or not the majority of operators are in favour of a reduction of the phone segment.

Incidentally, recently I have heard a couple of Americans in the Western Pacific saying that 14.111 MHz is the next logical frequency for the establishment of further Bulletin Boards. This strongly reinforces the points made under 5 above!

Yours faithfully,

Arthur C Oliver VK6ART,
9 Maycock Place,
Orelia, WA. 6167.
ar

* * *

AMATEUR RADIO MAGAZINE

AR is a quality magazine — it has improved considerably recently — keep the improvements coming. Some articles do waffle a little.

Under no circumstances reduce the size, content, frequency, etc. If it costs us more then that is the price we have to pay. It is a question of priority. Remember, the large team of contributors who give their best for no payments.

73,

Stan Dogger VK2KSD,
71 Lonsdale Avenue,
Berowra Heights, NSW. 2082.
ar

* * *

STANDARD OF AR

First let me congratulate you and your team on the fine magazine which AR is. I came up through the ranks of CB and used to purchase, from time to time, magazines that dealt with CB and amateur radio. These were the glossy local and overseas offerings which were, and still are, a lot dearer than AR. I gained a limited call and then upgraded with the help of the WIA Morse tapes. I began to use the QSL Bureau and saved a mint on what I had been spending sending QSL cards direct. I also note that the Book Sales service allows purchase of popular texts at prices considerably lower than any other source.

Why is it then that you seem to be continually apologising for the costs of providing all the services listed on page 2 of September 1987's edition of AR? In particular, the cost of producing AR seems to cause much heartache. If I did not subscribe to membership of the WIA I would have to purchase a glossy at a cost of at least $2 and maybe $3 per month. That would be between $24 and $36 per annum. I would have to pay full tote odds for any text books and have to bear the full cost of QSLing. I do not use repeaters but, if I did, I would not have the use of them without the WIA. So, I am streets ahead by being a member.

I strongly object to any reduction in content of the magazine. I do not approve of the change of the front cover from full colour to two colour. I would much prefer to see **more** colour content and more articles from members. I would be prepared and would expect to pay more for this **but I expect** for my subscription to the WIA to have the magazine. In other words, one of the reasons for my being a member is so I can have AR. It is valuable to me. If it costs more and more to produce, then I fully understand the reasons why. I am totally against the magazine being made into an inferior product just to remain within unnecessary cost constraints. If the magazine is of a high standard it will sell itself. Colin MacKinnon VK2DYM, said it all in September AR and I echo his sentiments.

Please find a simple program written in Basic for the computation of antenna dimensions which I wrote some time ago. I used it to design a beam and it is the first of a series of articles I intend to submit for possible publication to support my magazine.

Yours sincerely,

Dean Probert VK5LB,
RMD Verrall Road,
Hope Forest, SA. 5172.

Thanks for your comments, Dean. Your article has been passed on to our Technical Editors. —Ed

ar

* * *

THE WIA: MORE YET!

There has already been much said about WIA membership, the directions of amateur radio, etc, so a little more won't hurt.

The fact that the whole direction of amateur radio (and the Institute), appears to be in turmoil does not surprise me very much.

As an ex-member of one of the time honoured professions (not the oldest!), I was only too well aware, that, even since my student days, the executive of that professional institute were virtually disembowelling themselves analysing directions and generally trying to make their services more relevant to the public and current needs.

In fact, however, I resigned from that institute long before I retired from the profession, simply because the membership dues became too high. Whether the services provided were "good value" or not was largely irrelevant to me, I simply felt that the outlay for membership became too great.

What still does surprise me, however, is the apparent intolerance shown by various groups within the amateur fraternity to each other. The case of CW comes to mind, but there are others.

In the present issue there seems to be a vast gap in understanding between the "have" and the "have nots", the inference of many letters being that all one has to do is to forgo the odd drink or a packet of cigarettes to afford any increases in membership dues.

Fine, but what if one does not smoke, play the pokies and has long ago given up the odd drink as beyond one's means? (One's equipment could well be a relic of more prosperous days!).

The station licence and WIA membership now amount to about a dollar a week. But if one cuts out the membership it is only half of that. The "haves" may find it hard to imagine, but this could be an important consideration for some.

It has also been suggested that the Institute should adopt a harder marketing approach to "sell" itself, and perhaps, in this day and age, when national elections are decided on marketing strategies rather than national issues, this may well be the way to go.

Personally, I find it all rather sad, and slightly immoral, to sell something to people when they did not even know they wanted or needed the service or product.

Perhaps I am old-fashioned (certainly getting old), and probably very much in the minority, but I make a deliberate effort to avoid products and services that are heavily advertised or considered "up-market".

But, then there is little doubt that, if the WIA (and probably amateur radio as such), is to survive, it must keep up with the times and pander to the popular view of the majority, however unpalatable that may be to some, and irrespective of the fact that a few will be left behind, or simply cannot afford to keep up. (Good marketing strategies and glossy magazines don't come cheap).

So, if the Institute decides to go "that way" and become a sleek up-market organisation with a sophisticated marketing policy, it will make it that much easier for me to "forget" to pay my membership dues and have the odd drink instead.

So, good luck, and my sympathies to the Executive. Whatever you decide to do is going to tread on someone's toes, that is for sure.

73,

Dmitri Perno VK4BDP,
110 Panorama Drive,
Nambour, Qld. 4560.

Wise words, Dmitri. But we have no wish to become, or appear to become "sophisticated" or "up-market". All we are trying to do is to hold our place in a world where the passage of time makes it increasingly difficult. —Ed

ar

* * *

TECHNICAL CORRESPONDENCE — EARTH LEAKAGE

I refer to the article *Safety Around the Shack* by David A Pilley VK2AYD, in September 1987 *Amateur Radio*. The article is generally correct and quite informative; however, about halfway down the third column on page 10 it states — "It must be remembered that you no longer have an earth wire from the Distribution Board." This, of course, is not true, as current wiring rules in this country require an earth be provided at all power outlets and lighting points, and all portable ELCBs have the earth connection to the normal earth pin through the flexible lead, and must not be switched.

There is also no good reason to restrict earthed equipment in the area where ELCB protected distribution is used. In fact, the main use for portable ELCBs is with portable tools in outside locations, where the operator's body may be well earthed.

It should not be assumed that the tripping time for a normally commercially available ELCB is "around 30 ms" but it is generally closer to 100 ms as required in AS 3190 and is therefore not as safe as may be expected. Over the past couple of years, Telecom undertook the development of ELCBs that would operate at 10 mA and open the circuit within 30 ms. Clipsal are now marketing ELCBs that meet this criteria, and action is in hand with SAA to have AS 3190 tightened up with tripping time of 40 or 50 ms.

Figure 9 also indicates that no fault current protection is required if ELCBs are used. This is not correct. The regulatory authorities regard ELCBs as "Supplementary Protection" only, and not a substitute for the normal forms of protection.

I congratulate David on the preparation of this article.

Yours sincerely,

Bob Neal VK3ZAN,
11 Xavier Street,
Oak Park, Vic. 3046.
ar

* * *

UBIQUITOUS TWO PI

In reference to *Ubiquitous 2π*, July 1987 and the letter from Barrie Stevenson VK2ZSV, in September 1987 issue.

'Tis a favourite project of mine
A new value of pi to assign
I would fix it at three
For it's simpler you see
Than 3 point 1 4 1 5 9.

Quoted by W S Baring-Gould in *The Lure of the Limerick* 1970, Panther Books and attributed to Professor Harvey L Carter, Colorado College, USA.

Cheers,

K G England VK4JPE,
31 Morgan Street,
Rockhampton, Qld. 4700.
ar

* * *

COUNTRY MEMBERS

I refer to the letter from Ted Blackmore in October issue of AR. I am surprised that the attitude he has expressed still exists. I thought it had largely disappeared about 20 years ago after the State Conventions were transferred to country areas. Furthermore, it was, as far as I recall, policy for one or more members of the Divisional Council to attend Zone Conventions to discuss any problems with Zone members. As I have not been active in Institute affairs for some years I do not know if this practice is still followed, but I do know that I attended a number of zone conventions for that purpose. This action to some extent offset the inability of country members to attend Divisional meetings. Apart from not hearing speakers at meetings, it seemed that country members were not greatly disadvantaged and this situation probably still exists.

It was appropriate that you should draw Ted's attention to the September Editorial. Not all items listed would appeal or be of importance to everybody, but some at least should apply to him. If he is not impressed by your personal involvement with the Institute, I would invite him to attend a Tuesday Group meeting of the Moorabbin and District Radio Club, where I would be pleased to introduce him to 20 or so people who have between them devoted many thousands of unpaid hours to Institute affairs in both the State and Federal sphere during the last **60** years. Despite his attitude he will still be welcome because he is an amateur, be he a WIA member or not.

I am forced to wonder just what active participation Ted has taken in Institute affairs. Has he ever so much as submitted an Intruder Watch report? I am firmly of the opinion that one can get out of an organisation only as much as one puts in and I recommend this thought not only to country members, but to all members.

It is perhaps ironic that Ted's letter should appear in the same issue as the tribute to the late Max Hull. I would respectfully suggest that he rereads that tribute, and then feels humble at his own small contribution, and at the same time, proud to be accepted among the members of an Institute that has been served for so long by such men as Max. I know I am.

Yours faithfully,

Ken Pincott VK3AFJ,
14 Dunscombe Avenue,
Ashburton, Vic. 3147.

ar

* * *

LICENSING STANDARDS

The future of amateur radio, with band plans, foreign reciprocal licence privileges, examination formats, etc, has occupied an unusual amount of space in our magazine over the last few months.

Much comment in these columns and articles in this magazine on the subject I can only describe as elitist, espousing privileges for the least valid reasons.

Let us start back at square one, with the assumption that the use of the communication facility is not a privilege that someone gives to us, but a right (by birth in a free country) that anyone can take up, with certain restrictions for the good of all.

Radio or "wireless" and the motor car have had a parallel life span. In the early days the only means of starting the horseless carriage was with a crank handle in the front, and the exciter was a trembler coil as in the Model T Ford. The equivalent to the crank handle in wireless terms was the Morse key and the exciter was a spark gap and coil. There were so few cars that you didn't need a licence to drive or operate them. As the road and the airwaves became more congested, so rules became necessary, and drivers and operators had to prove by examination that they could drive their car or operate their transmitter without interfering with others. And so we progressed until today we have state-of-the-art cars and transceivers. Of course you don't have to drive a car, you can use public transport and never need a licence. You don't have to use amateur radio, there are public alternatives which require no examination or licence. But, if you decide to drive you have to be tested for public safety, with various grades of licence available for cars, trucks, buses, etc, depending on your experience and the weight of the vehicle.

And, so it should be for amateur radio operators, the novice licence should be just that! To learn the basics, not forever, but to progress forward just like the P Plate Driver for a set period and speed limit. Progress to the next stage should not depend on how fast you can swing the crank handle (Morse speed send and receive) but technical and practical tests to prove that you can adjust your equipment correctly so as not to interfere with others. For most amateurs, that should be all that is required to have a full call licence equivalent to a class one car licence in New South Wales.

The sooner we stop kidding ourselves that there is something special about CW the better, it is now just another mode of transmission. Does anyone seriously suggest that, to operate RTTY, you should be able to pass a touch type test at 10 WPM? The argument that a knowledge of Morse should be mandatory for emergency purposes does not hold up anymore, because most amateurs have amateur band only transceivers. We just do not listen for ships, planes, etc in distress on their frequencies. The chance that your average trawler or plane has amateur bands fitted, let alone a key handy, is stretching things a little!

If it is really necessary to have a higher grade of licence equating to a truck on the road, then let it be by technical and practical merit. Such a test could be the ability to locate and repair a fault in a piece of equipment submitted by the testing authority, or by submitting a piece of home-brew equipment to demonstrate skill, or perhaps a demonstration in the correct use of test equipment such as a dip meter or CRO, but certainly not by the ability to send and receive faster CW.

To sum up: amateur radio has a future but only if we make it less restrictive to those who are interested for any valid reason. What does it matter if one person only wants to operate equipment he has home-brewed. Or a combination of say, a commercial rig with a home-brew transverter. There is room for all who wish to qualify provided we don't make it too restrictive.

To my mind we should not reduce standards any further and certainly not for another country's novices who wish to visit this country. Nor should that excuse be used to give our own novices an extra band unearned. If it is desirable to have a common band, it would appear that the fault lies with the LAOCP holders who have never made an effort to progress to AOCP. It is not that hard to learn CW. I am told that during the war, shop assistants could be proficient in the Army in six weeks. But, perhaps we should lobby the DOTC and the next WARC to remove the HF CW requirement and encourage quality not quantity in our amateur ranks.

73,

Neville Chivers VK2YO,
51 Meeks Crescent,
Faulconbridge, NSW. 2776.

ar

* * *

Club Corner

SUMMERLAND AMATEUR RADIO CLUB

A warm welcome is extended to the latest members of the Summerland Amateur Radio Club (SARC):

Bruce VK2LBW, Peter VK2XHR, Graham VK2FGI, Ron VK4MBJ, Bruce Greig and Alan Jackson.

Thanks to Gordon VK2AGE and Alec VK2BEV, the club has formed a packet society "SAPS". The following is an extract from the club newsletter.

SAPS has received site access approval to establish an experimental digipeater for a six month trial period on the RTN-8 television tower at Mount Nardi, approximately 800 metres above sea level and 30 kilometres north of Lismore. The digital repeater is currently under test from the QTH of VK2AGE.

It is anticipated that the initial installation will be operational by this time using the call sign VK2AGE-1, pending the processing of a licence application, lodged with DOTC on August 19, 1987. Initial frequency in use will be 147.575 MHz (Channel 7575) with the addition of either a 70 centimetre frequency for local working or 147.600 MHz (Channel 7600) to enable working into VK4.

Hopefully, this coverage will be at least to Coffs Harbour in the south, Tenterfield to the west, and Brisbane to the north.

Stations intending to utilise this project — please do not forget we need your financial support, $10 per annum, to repay loans in respect of this repeater. We also welcome use of this equipment by all appropriately licensed amateur stations.

Finally, as the equipment becomes available, it is SAPS intention to establish a club packet station at the SARC clubrooms in Richmond Hill. Equipment surplus to requirements should be forwarded that way rather than towards the "depot."

At last, members of the SARC have a home — an identity — a set place to meet "anytime", to study, work and play.

Your time is needed each and every Sunday afternoon to make the clubrooms a place that visitors and members alike will want to return to.

Thanks to the hard work of members, much work has been done so far with cleaning, painting and building, but much more must be done and more members need to become involved.

Being a radio club, many members are not within a reasonable distance for regular visits, although that should not stop you from helping out occasionally.

Stools, carpets, blue metal, working radios, books, kitchen items, curtains, etc, etc, are needed.

There are many projects that can be built for the workshop and operating rooms. Unwanted test equipment, tools, etc would be appreciated — in fact, anything would help.

Most of all we need your help. Gratitude must go to members and friends who have helped so far, but we still need your help.

If you are proud to belong to this club and want clubrooms you can identify with and say that you helped to create, then contact Peter Richens VK2XHL, or Ric on two-metres 6800.

The club now boasts a membership of 103, believed to be an all-time high.

Each member of the SARC extends season's greetings to all other amateurs — A Happy Christmas and a Great 88.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer

ar

AMATEUR RADIO CLUB "POLONIA" INC

The committee of the ARC Polonia, Melbourne are pleased to announce that the club was recently granted the use of the special call sign VI88ABC. This call sign will be used from January 4, 1988, in conjunction with the club's special activities during Australia's bicentennial celebrations.

In January, the club will mount an expedition into the Australian Alps during which time the special call sign will be used. The significance of the call (VI88ABC — Australian Bicentennial Celebrations) will be explained to overseas operators.

All contacted stations will receive a specially designed commemorative QSL card.

Amateur Radio Club "Polonia" is registered by the Australian Bicentennial Authority and the club's planned alpine expedition is listed in the Bicentennial Calendar of activities.

Further information is available from George Kaska VK3OO, on (03) 337 4903 (After Hours).

The club conducted a very successful operation with the call sign VI3PVA during the Papal Visit to Australia.

ar

Obituaries

JOCK CHRISTENSEN VK3DOJ

It is sad to report the sudden passing of Jock on October 12, 1987, after heart surgery.

We became good friends some 10 years ago, through many common interests, mainly amateur radio and journeys together over much of Australia in our four-wheel drive vehicles. (See AR, April page 30).

Jock was a true family man who always tried to take his wife Maude, sons, daughters and grandchildren, wherever he went. He was a clever man with things mechanical, automotive and radio, and enjoyed a love of the outback and bush. He was a great companion.

His young grandchildren who accompanied him on his journeys will never forget how he taught them to admire and love the wonderful works of nature shown to them through the great diversity of our country.

I express words of sympathy and fond memories, on behalf of our many mutual friends, to his wife Maude and all the family.

Keith Scott VK3SS
ar

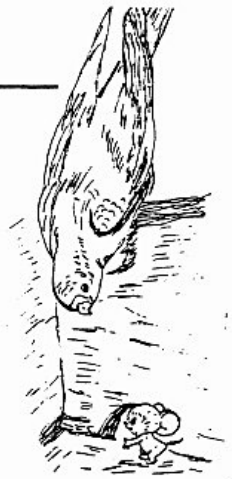
CEDRIC SMYTH VK3ACH

Cedric Smyth VK3ACH, passed away on June 17, 1987, whilst on holidays with his wife, Mary.

Cedric became ill in Alice Springs and was advised to return, however he passed away in South Australia.

Sympathy is extended to Mary and his family.

Reg Bulman
ar



DEADLINE

All copy for inclusion in the **February 1988** issue of *Amateur Radio,* including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, December 29, 1987.**

Silent Keys

MR JOCK CHRISTENSEN VK3DOJ
MR CEDRIC SMYTH VK3ACH

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co. Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

HELP WANTED — AUST

See over page...

GERMAN STUDENT OF ELECTRONIC/ELECTRICAL ENGINEERING: (6 sem), 26 years of age, with a good knowledge of English, is looking for a position as a probationer in Australia to complete a practical training semester. If possible from October 1988 to March 1989. Please contact Achim Klemmt DL3LBN, Bamtschowstrasse 2, 2000 Hamburg 65, West Germany. Ph: (040) 536 2302 or (0451) 59 3424. (ISD codes will apply).

WANTED — ACT

US MADE HF 4-BAND VERTICAL ANTENNA: Information & circuit diagram for Swan power supply, PSU-5. Write to Richard VK1UE, QTHR.

WANTED — NSW

DRAKE R7A, JRC NRD-515 RECEIVERS: Also old ARRL & RSGB handbooks wanted by SWL enthusiast. Will pay well. Tony. Ph: (042) 29 2573.

WANTED — VIC

ANY OLD HAM-M or HAM-2 (etc) ROTATOR: for spare parts. In any condition for wrecking. Bob VK3SK, QTHR. Ph: (03) 527 1861.

QSL CARDS: of any description. Pre-war, rare DX and QSLs of artistic design especially appreciated. These are wanted urgently for the WIA (Vic Div) QSL collection now being established. Please contact the Hon Curator, Ken VK3TL, on (059) 64 3721 and arrangements will be made to pick up the cards whether you live in Melbourne or in the country. You can also leave QSLs at the WIA rooms in Fitzroy. Please help us make it a really fine collection.

FT-7 HF TRANSCEIVER: 80-10 metres for novice use. In good condition, price $385-$400. Ph: (051) 27 4094.

HANDBOOK/CIRCUIT: for Yaesu Musen FRG-7 receiver — original or photocopy. Details & price to G Himolij, 118 Wilson Road, Newcomb, Vic. 3219. Ph: (052) 48 1410.

WANTED — QLD

5-30 W CW HF TCVR: VFO preferred. Suitable portable working. Must be good unit. Details to Jim VK4CBU, 14 Tristania Street, Everton Hills, Qld. 4053.

EX SIG WANTS OLD ARMY WIRELESS SETS: 108, 109, 11, 22, 128, PRC10, xtal calibration No 10. Buy or swap 4321 Friden Mag Tape Recorders. CDC 9450 disk units, teletype 33A KSR (10 CPS) Cossor DID 400 VDUs. VK4EF, QTHR. Ph: (07) 366 1803 AH.

ICOM IC-745 HF TRANSCEIVER: with matching power supply. Would need to be in VGC. Interstate calls welcome. John VK4YX, QTHR. Ph: (076) 61 4877.

KENWOOD TS-520S HF TRANSCEIVER: All reasonable offers considered. Theo. Ph: (071) 71 6714 Bundaberg.

MORSE & OTHER SIGNALLING EQUIPMENT: Lamps, tape-readers & heliographs, etc. Contact Fred VK4NMA, QTHR. Ph: (07) 396 3521.

PS20 KENWOOD POWER SUPPLY: Interstate replies welcome. Mike VK4VIX, PO Box 471, Redcliffe, Qld. 4020.

FOR SALE — ACT

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — NSW

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FT-102: in good working order. $800 ONO. TS-120, plus mobile cradle. $450. 8 amp power supply. $75. 100 watt HF linear. $200. Ph: 9065) 53 9607.

HYGAIN TH5DX BEAM: Ham II rotator with CDE controller, wind-up tower 20 to 35 feet. Prefer to sell as complete lot. Purchaser to arrange dismantling and removal. Offers in writing to VK2AGS, QTHR.

ICOM IC-730 HF TRANSCEIVER: Excellent condition $650. Neil VK2KCN, QTHR. Ph: (02) 634 1882 AH or (02) 50 8832 BH.

ICOM ML1: 10 watt linear amplifier for IC-2A hand-held, as new. $85. Heathkit transistorised mobile power supply, HP-10. $50. Konrad VK2DFM, QTHR. Ph: (02) 621 1039 AH.

TELEQUIPMENT D61 DUAL BEAM 10 MHz OSCILLOSCOPE: Complete with manual and 1 probe. Excellent condition. $300. VK2HL. Ph: (02) 981 4762.

YAESU FT-209RH 2M HAND—HELD: with rubber duck & helical antennas. HL35V 2m linear amp. 2 nicad battery packs, speaker mic, manual & circuits. Mint condition. The lot $700 ONO. Vince VK2CVR. Ph: (02) 602 2085.

YAGI BEAM: 4 element triband TET HB34D. $225. Kenpro rotator KR600. $225. Yaesu desk mic MD1B, currently $160, sell for $75 plus post. VK2AOO, 38 Third Street, Blackheath, NSW. 2785. (not QTHR). Ph: (047) 87 7459.

FOR SALE — VIC

21 METRE, THREE SECTION, FREE-STANDING TRIANGULAR RADIO TOWER: $600. 21 metre three section guyed Hills telescopic radio tower. $300. Ph: (03) 754 7358.

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

BATTERIES: Quantity of 6V 120AH lead acid batteries, suitable for stand-by power for shack, weekender or repeater, etc. Good condition, little use on float service for which they are designed. Eric VK3AX, QTHR. Ph: (059) 68 4202.

HY-GAIN TH6 DXX 6 ELEMENT TRIBAND ANTENNA: (20-15-10). Anti-corrosion treatment applied. Has worked 250 DXCC countries. Price $275. Dick Forrester VK3VU, QTHR. Ph: (053) 39 1001 BH or (053) 35 7663 AH.

ICOM IC-R71E COMMUNICATIONS RECEIVER: .0-30 MHz. 10 hours use, as new in carton. $1080. Philips FM747 10 channel UHF mobile. 5 amateur UHF repeater & simplex fitted. Remote telephone handset/spkr. Installation cradle. 15 watts 12 VDC. $385. VK3ADM, QTHR. Ph: (03) 592 2168 AH.

KENWOOD TS-520S HF TRANSCEIVER: with H/book $450. Kenwood DG5 digital readout with H/book $150. Kenwood QR666 comm rx with H/book $120 ONO. Himound hand-key $20 ONO. Dick Smith Electronic keyer. $35 ONO. All gear in good condition, working. Ex VK3NFU. Bruce VK3AIE, QTHR. Ph: (03) 758 5791.

KENWOOD TS-930S HF TRANSCEIVER: with auto ATU, mic, manuals, original carton, in as new condition. $1975. Sideband filters. Superior quality set of 2 Fox Tango filters (8.83 MHz and 455 kHz), 2.1 kHz bandwidth, designed for TS-930S, complete with installation instruction sheet, $165. 9 MHz, 2.4 kHz bandwidth, replacement xtal filter for FT7, FT7B, FT301, etc. $65. Yaesu FT7 HF transceiver. Professionally modified to include linear relay switching, variable drive control, 20 dB attenuator, fast/slow AGC, etc. In unmarked as-new condition, complete with mic, handbooks and cables, etc. $395. Tandy TRS80 colour computer 2B. 64k, true lower-case on screen, disc controller and 40 track drive 0, Graphicom joystick, 42 disks of business, games, utilities, amateur radio, and OS9 programs with instruction books, manuals and all required cables. $470 the lot. VK3ARZ, QTHR. Ph: (03) 584 9512.

SINCLAIR SPECTRUM COMPUTER: 48k with games programs. Can do SSTV & RTTY. Ex cond. $240 ONO. VK3ZR, QTHR. Ph: (060) 24 6430 BH.

STC 151 XTALS: New, over order, chan 7225. 3 sets. $19 per set. VK3QQ, QTHR. Ph: (03) 434 3810.

YAESU FT-107M TRANSCEIVER: Has FP107 power supply fitted, CW filter, YM35 scanning mic, FV101DM digital memory VFO, SP901 speaker. With manuals & cartons. $850. Ray VK3CDR. Ph: (03) 726 9222.

FOR SALE — QLD

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

ICOM SERVICE MANUALS: New, as follows: 2 each IC-M12, IC-745, IC-125/T/TM. 1 each IC-740, IC-M80-, IC-27A/E/H, IC-4A/AT/E, IC-02A/AT/E. All $16 each posted. VK4FPW, QTHR. Ph: (079) 82 6756.

MORELLI FV20 MICROWAVE LINK SYSTEM: Complete with manual. Tcvr CTR 97. 960 telephone channels, 1 TV channel. Freq 2 GHz. Rack mounted 2100, 596, 381.5 (HWD mm). Offers please. Tom VK4BTW, QTHR. Ph: (076) 38 3828.

FOR SALE — SA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

MBA-RC CODE CONVERTER. CW 3-99 WPM. Baudot RTTY 60, 67, 75, 100 WPM. ASCII RTTY 110 Baud. Fluro display 32 characters. Made by AEA Pdts. Manual, etc. Morse-A-Keyer keyboard. CW 5.45 WPM. Inbuilt osc. Can be used with MBA. Both in A1 cond. $400 for both plus freight. Eric Steele VK5PM. Ph: (088) 53 2091.

FOR SALE — WA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — TAS

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

ICOM IC04A: Almost brand new — used only on overseas trip. Complete with protective case, manual, spare battery case & gutter grip antenna mount. Approx $450. VK7AH, QTHR. Ph: (004) 24 5375 evenings.

WILSON 3 ELEMENT 10 METRE YAGI ANTENNA: $40. 7 element 2 metre Yagi antenna, $25. Tandy antenna rotator. $60. Jim VK7JO, QTHR. Ph: (003) 44 3314.

YAESU YC-221 DIGITAL DISPLAY: new unused, in original packing. $65. JVC Colour Camera GC-3300E, electronic view finder, 10m extension cable, 6X zoom lens, built-in mic, in CB-57U transit case. $490. VK7LR. Ph: (004) 24 2525.

❖ ❖ ❖

Advertiser's Index

❖ ❖ ❖

Coaxial Cable Specials

Low Loss VHF/UHF Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
	**9913** 80C	9½ (Solid) .108 bare copper .90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene .285	7.24	Duobond II* + 88% tinned copper braid 1.8 Ω/M' 6.0Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
						Black PVC jacket.						

BELDEN 9913 low-loss VHF/UHF coaxial cable is designed to fill the gap between RG-8 to RG-213 coaxial cables and half-inch semi-rigid coaxial cable. Although it has the same O.D. as RG8/U coaxial, it has substantially lower loss, therefore providing a low-cost alternative to hard-line coaxial cable. Your special price from ACME Electronics is only $4.84 per metre.
BELDEN Broadcast Cable RG-213/U MIL-C-17D is only $5.23 per metre, or BELDEN 22385 YR Commercial Version RG213, the same specification as 8267, for only $2.14 per metre. *Prices do not include Sales Tax.

For more information about the above, or any other BELDEN cable, simply contact our resident amateur radio operator, Colin Middleton (VK3LO) or our sales department.

Coaxial Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
 **RG-213/U MIL-C-17D**	**8267**† 1354 60C	13 (7x21) .089 bare copper 1.87Ω/M' 6.1Ω/km	Poly-ethylene .285	7.24	Bare copper 1.2Ω/M' 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	50 100 200 400 700 900 1000 4000	1.6 2.2 3.2 4.7 6.9 8.0 8.9 21.5	5.2 7.2 10.5 15.4 22.6 26.3 29.2 70.5
						Black non-contaminating PVC jacket.						

ACME Electronics
205 Middleborough Rd, Box Hill. Vic. 3128.
Ph: (03) 890 0900.
Fax: (03) 899 0819

SYDNEY (02) 648 2255
ADELAIDE: (08) 211 8499
BRISBANE: (07) 854 1911
LAUNCESTON: (003) 31 5545
DARWIN: (089) 81 5411
PERTH: (09) 272 7122
HOBART: (002) 34 2811

ACME 709

bail NEW from YAESU

FT211RH 2m 45W mobile **$699** FT290RII **$868**
FT690RII **$850** Linear Amps for these Mark II models
FL2024 **$219** — FL6020 **$199** FT23R with FNB11 (12V) nicad, and charger **$525**

FT-757GX in stock

Converters for FRH9600 V/UHF Receiver — FC965DX 20 kHz — 60 MHz **$184**
FC1300 to 1300 MHz **$284** FRG9600 with power adaptor **$999**
FRG8800HF Communications Receiver **$1125** *while stocks last.*

UHF Specials — FT703R **$395** FT709R **$479** both with FNB 4 (12V) nicads and chargers.

Diamond Trapped Vertical Antennas — HIDAKA HF Triband Beam
Katsumi Electronic Keyers, Power/SWR Meters.

bail

BAIL ELECTRONIC SERVICES
38 FAITHFUL STREET, WANGARATTA 3677
Telephone: (057) 21 6260
Mail Orders, Mastercard, Visa and Bankcard Welcome.

Stan Roberts and Staff — VK3BSR

BAD NEWS FOR ANYONE WHO EXPECTED BIG THINGS FROM ICOM.

The biggest news in hand held transceivers is actually very, very small.

It's the new generation ICOM IC-μ4AT and its midget twin, the IC-μ2A.

Both pack all the performance and reliability you expect from ICOM into a tiny package. And although they weigh next to nothing, they're not light-on for features, as you'll see.

The IC-μ4AT has built-in power saver circuitry that uses as little as 8 mA of current flow during standby. So it will last up to four times longer than some older equipment. Yet it measures only 58mm wide by 140mm high by 29mm deep with optional BP-22 battery pack.

It also has a DTMF pad, 10 memory channels with convenient digit up/down switches, subaudible tone encoder, and a comprehensive LCD display with special backlighting that turns off when not being used.

The IC-μ4AT can operate at a full 2W of output power from the optional BP-24 or optional converter with 12V battery. And its durability makes it ideal for operating in rugged outdoor environments.

The IC-μ2A also has 10 memory channels and the top panel LCD for easy readability and puts out up to 2.6W of output power from the BP-24 battery pack.

Like its counterpart, this 2 metre transceiver features Digital Touchstep Tuning for fast shirt-pocket frequency adjustments. And of course, both can use most existing ICOM hand held accessories plus a new line of long life nicad battery packs.

So if you want big things from a small transceiver, get your hands on the ICOM micros soon.

For details of your local dealer phone ICOM on Melbourne (03) 529 7582 or (008) 33 8915 from elsewhere in Australia.

ICOM